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WE repeat our notice, that Mr. HOWE'S treatise on the Metallurgy of Steel, which is now in course of publication in the ENGINEERING AND MINING JOURNAL, and which is by far the most complete and valuable work ever written in any language on the manufacture, properties, treatment, and applications of this metal, will extend through a year, at the average rate of five pages a week. Those who desire to secure this work complete should at once notify the publishers, otherwise it will be impossible to furnish full sets of the JOURNAL containing it.

THE COPPER PRODUCTION OF THE UNITED STATES IN 1886.

The statistics of the production of copper in 1886, as compiled by Mr. C. KIRCHHOFF, JR., for the Division of Mining Statistics of the United States Geological Survey, have just been issued, and they are only less valuable than in former years, because they have been substantially anticipated by the more detailed statistics published in the ENGINEERING AND MINING JOURNAL on the 1st and 8th of January last. The statistics we then published, though necessarily estimated as to a portion of the month of December, were accurate, as compared with these late and full returns, to within about 2½ million pounds out of 160,000,000 pounds, or 1·6 per cent. For all practical purposes they were, therefore, "full and accurate" as well as "prompt."

We recognize Mr. KIRCHHOFF'S painstaking zeal as a statistician, and the information he has collected concerning the consumption of copper is interesting, and confirms the less complete returns we had received and published on the 1st of January.

Mr. KIRCHHOFF'S figures of total production, which are 2,600,000 pounds greater than those we published, show an increase of 728,838 pounds in the lake output and 1,843,825 pounds in Montana, where even the returns made to us were considered by many persons, familiar with the output of the mines, as perhaps too large.

Arizona Mr. KIRCHHOFF gives a little less to than did our returns, and other States and Territories and desilverizers are credited with about as much more as Arizona has less than our returns gave. Excepting the increase in the Montana output, which may be questioned, Mr. KIRCHHOFF'S aggregates differ from ours by less than half of one per cent. This may be considered as a full confirmation, if any were needed, of the accuracy of our statistics collected and published on the last day of the year.

PROGRESS IN THE UNITED STATES.

In discussing the prospect of the United States becoming a large market for English iron manufactures, notwithstanding "the great productive powers of their (our) iron industries, coupled with high import duties," one of our exchange English trade circulars quotes the following eloquent figures:

"Without venturing to express an opinion, we may, nevertheless, call attention to a few facts which bear on this point.

"In less than 20 years the United States have reduced their debt by about £220,000,000. They ended their fiscal year, 1886, with a surplus of about £18,000,000. They added during 1886 to their system of railways 8600 miles, making in all 130,000 miles, worked by 27,000 locomotives, costing approximately, £1,650,000,000. In 6 years, 1880–1886, *the population increased 20 per cent*, namely, from 50,000,000 to 61,000,000. In 1885, they raised 357 million bushels of wheat; in 1886 they raised 457 million bushels, an increase of more than 27 per cent, or 100,000,000 bushels. In 1885, their shipping ports received 4,451,663 bales of cotton; in 1886, they received 5,177, 235 bales, an increase of more than 11½ per cent, or 725,572 bales.

"In comparison with these figures the progress of all other countries becomes insignificant."

The metals and mineral products of the United States in 1885 had a "spot" value of £85,704,271, as against a value of £58,428,608 for the mineral produce of Great Britain in the same year. Certainly these are eloquent figures, and account for the fact that the attention of the entire technical world is directed to this country to learn the secrets of this marvelous progress and to profit by the skill which has been acquired in effecting it.

The mineral production of the United States this year will, no doubt have a spot value of $500,000,000.

THE FOREST HILL RAILROAD ACCIDENT.

The terrible catastrophe which occurred at Forest Hill, on the Dedham Branch of the Boston & Providence Railroad, on the 14th inst., is the third that has taken place this year. Can these accidents all result from causes which it is impossible for the ingenuity of mankind to foresee and prevent, or are they attributable to culpable negligence and gross incapacity? This is the question which we trust a competent tribunal will propound, and which the various officials of the Boston & Providence Railroad Company will have to satisfactorily resolve.

Mr. JAMES A. FULSOM, who is responsible for rebuilding the Bussey Woods bridge, some ten years ago, is credited with saying that for twenty previous years it had been supported by one iron and one wooden truss, and that, since the new iron truss was put in, the safety of the whole structure has been unquestioned!

He is also reported to have stated that he had no idea when the bridge was last inspected, and that, although certain rumors as to its defective state had reached his ears, he has personally taken no trouble to test their accuracy!

It would yet be premature to make accusations or speak dictatorially on this matter, but as more than 30 lives were lost and over 100 persons were injured, it is not too soon to call attention to some facts that, if they rarely appear in print, are nevertheless widely recognized among engineers.

From the published accounts, it would appear that some of the main pieces of the bridge broke while the engine and first cars of the train were crossing (if indeed they had not broken under some previous train), and that finally the whole structure collapsed.

What was the original strength of the bridge is an interesting question that will have to be answered; but it is a fact that a great many of our old iron railroad bridges were built when locomotives and cars were 30 to 50 per cent lighter than they are to-day, and they are habitually strained far beyond the working limits for which they were designed.

Competent experts, fearless in the execution of their duty to the public, will doubtless soon make known the causes of the breakdown, and we can only hope that, pending whatever revelations may be made our other railway companies will take to heart the fearful lesson, and redouble in vigilance and precautionary measures. As engineers, our supremacy in bridge building has long been our proudest boast, and it behoves us to look to our laurels lest we lose our reputation.

THE QUAKER BRIDGE DAM.

The New York Aqueduct Commission has voted with almost complete unanimity for the constrction of the proposed high dam at Quaker Bridge, but Judge J. C. SPENCER, constituting the minority of one, has made a protesting report; and some of the New York daily newspapers seem inclined to echo this protest, and to treat the question as if there were equally weighty opinions on both sides, and therefore there should be either a decision in the negative on ground of economy, or else, at least, a further delay of action. In point of fact, however, this is by no means the situation of affairs, as the following statement of the case will show:

1. Concerning the feasibility of making at Quaker Bridge a permanently safe dam of the proposed dimensions (say 277 feet height above solid bed-rock, 178 feet above bed of Croton River, 500 feet length at bottom, and 1500 feet length at top) there is no difference of opinion among competent hydraulic engineers The dam will be in some respects perhaps the largest, but not the most difficult of construction, in the world. If built according to ancient and well-tested principles, securing stability solely by the inertia of mass, its dimensions will introduce no elements of special difficulty—nothing, in fact, which can not be exactly calculated before hand. Designs intended to save cost by diminishing mass should, of course, be rejected as hazardous experiments. If this is done, the engineering question is settled.

2. Concerning the site, Judge SPENCER says frankly that it is undoubtedly "the best site for a dam and reservoir that can be found at any point below the present Croton dam."

3. The construction of the Quaker Bridge dam and reservoir is part of the original plan of the new and enlarged water-supply. This feature of the plan constitutes really the justification for the expensive work of the new aqueduct. Chief Engineer CHURCH, who had spent many years in maturing the scheme now in progress, and who understands it in all its bearings better than any other living man, never dreamed of separating the aqueduct from its necessary accompaniment, an adequate storage-capacity. It is not his fault that the dam and reservoir were not begun, as they should have been, when the work was first laid out. The delay thus far has been chiefly due to the opposition of interested parties. We think the whole plan not only a good one, but the best that could have been devised under the circumstances; but, whatever may be the case in that respect, the plan goes together as a whole, and to leave out the Quaker Bridge dam now is to make of the aqueduct itself a monstrous blunder.

4. The evils of the present situation as regards the water-supply are two. In the first place, the old Croton aqueduct is carrying a great deal more water than it was built to carry, and there is constant danger of a break-down, the result of which would be immeasurable injury to the health, comfort, and business of the city. In the second place, even this excessive burdening of the old aqueduct does not give the necessary supply and pressure of water. Now the new aqueduct, constructed at enormous expense, will, of course, remedy the first of these evils. It will replace the present precarious conduit. But without large additional storage capacity in reservoirs, it will not remedy the second. The opponents of the Quaker Bridge dam profess to believe that the building of Sodom dam and some other temporary devices will do for the present, and give time to consider what shall be done next. This is a delusion. The course proposed would simply prolong indefinitely the discomfort and disgust of our citizens, and hinder the growth of our city.

5. A few figures will enforce this proposition. The daily consumption of water *per capita* in Pittsburg, where it is all pumped, is 160 gallons; in Chicago, under similar conditions, and with a loss of pressure already felt as an inconvenience, 113 gallons; in Washington, where the pressure is so much reduced that expensive works are building to increase it, 150 gallons; in Detroit, 129 gallons; in Wheeling, 129 gallons; in Poughkeepsie, 137 gallons; in Watertown, 200 gallons; in Kingston, Canada, 171 gallons. If the pressure were adequate in Chicago and Washington, the consumption would be greater. Considering the conditions obtaining in New York, where a long-continued low pressure has left a large proportion of the plumbing unused and unrepaired for years, where the legitimate consumption of water is exceptionally great, and where the use of Croton water is notoriously wasteful, it is not safe to calculate upon less than 150 gallons *per capita* daily, for some years at least. It is true that thorough general repairs of plumbing and mains may ultimately reduce this amount; and it is true that rigid restrictions by the municipal authorities might reduce it still further. But it must be remembered that we are spending these millions of money to secure if possible an *abundant* supply, and to avoid the necessity of such rigid restrictions. Allowing, however, something for savings which can be at once effected, and something for the Bronx River supply (say 6½ gallons *per capita*), we still have need, for a population of 1,500,000, of 200,000,000 gallons daily, or about 134 gallons per head. This must be got from the Croton River, which varies in its flow from 10 millions to 8000 millions per day—an irregularity which must be equalized by storage. To bridge over such droughts as have been known to occur, a total storage of 38,000 millions gallons will be required. The present capacity is 9000 millions. Hence 29,000 millions additional capacity will be required. That is the whole story. And it is an old story. It was fully told and thoroughly discussed by ISAAC NEWTON and B. S. CHURCH in 1882, 1883, and 1884; and with Chief Engineer NEWTON'S report of February, 1883, was submitted an opinion, signed by JOHN B. JERVIS, JAMES B. FRANCIS, GEORGE S. GREENE, JULIUS W. ADAMS, and ROBERT K. MARTEN, which, after summing up the different propositions, concludes, "We therefore unhesitatingly recommend the Quaker Bridge plan as the best, in fact the only plan that can, consistently with the best interests of the city, be adopted, for securing a large additional water supply from the Croton Basin."

6. In his latest protest, Judge SPENCER lays special weight upon the notion that the water stored in the large reservoir at the entrance to the aqueduct will be less pure and wholesome than if drawn from smaller reservoirs higher up the streams and allowed to flow through the open beds for some distance before entering the aqueduct. On this point, the testimony of our first sanitary authorities is against him.

7. Concerning the cost of the proposed dam and reservoir, we have no doubt that the estimates of the engineers are reliable, so far as they go. The work on the aqueduct thus far has been done for somewhat less than the estimates originally made. The cost of lands condemned, and taken, is an extra item with which the engineers have nothing to do. But whatever this may fairly amount to, the necessity must be faced. The Quaker Bridge dam is necessary. The Aqueduct Commission has at last recognized that fact, as it should have done at least three years ago. Its delay in the matter has done no good whatever, but has postponed the realization of the full advantage to the city for which the aqueduct was designed.

CORRESPONDENCE.

[We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.
All letters should be addressed to the MANAGING EDITOR.
We do not hold ourselves responsible for the opinions expressed by correspondents.]

The Amador and Middle Bar Gold Mines.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In your article on Stock Gambling in the issue of March 5th, you remark that "the Amador gold mine and the Middle Bar gold mine are being skillfully worked up." Perhaps a little inside information on these "prospects" will be interesting to the owners of stock and intending investors. Both mines are being manipulated by the same promoter, and both as investments have the same small value. The former has the more extensive development, consisting of a shaft, now operated, of about 130 feet, on which is a water-power hoist, but is entirely off any vein; some few small stringers of quartz have been cut and a few pounds of quartz extracted, and the sole merit of the claim appears to be that it is situated about 1000 feet south of the "Moore" mine, in which a very rich deposit has been encountered, the ore-chute of which, unfortunately for the Amador gold mine, pitches to the north.

The improvements of the Middle Bar gold mine consist of a shaft some fifty feet deep on the west bank of the Mokelumne River, and forty feet above its bed, from which about fifty tons of low-grade ore have been extracted at intervals during the past fifteen years. This property, if it were not for its small area, might be called a fair "prospect," but not a mine. The claim infringes on several other claims and agricultural patents, and has been rejected for patent at the Land-Office at Sacramento.

The owner of the claim, W. T. Robinson, represents that he is under salary from the company as superintendent, but just what his duties are, further than to make glowing reports, is difficult to understand. In fine, the total value of the two mining properties, with all improvements, can not exceed $35,000, and no one in the vicinity would give half of that sum. All of the old workings on the Amador mine, bragged of in the report as developments, are of positive injury to the property, showing nothing of any value so far as they go. TRUTH.

March 12, 1887.

Greatest Tunnel Driving on Record.—Reports come from the engineers in charge of the construction of the Colorado Midland Railroad, which show remarkable progress in tunnel driving. The Colorado Midland Railroad starts at Colorado Springs and runs through Ute Pass and Eleven Mile Cañon, to Leadville. In the Ute Pass are nine tunnels, the longest about 600 feet. Tunnel No. 5 has recently been completed, length 515 feet. On the week ending November 17th, a run of 98¼ feet was made with two Ingersoll "Eclipse" drills, size "D," 3 inches diameter of cylinder. Following are the particulars: Material, hard red granite. Heading, 8 × 16 feet section, commenced October 17th; completed November 17th. Contractors in charge of tunnel, McMurtrie & Streeter. Superintendent of tunnel, F. W. Dashe. This goes on record as the greatest tunnel drive that has ever been accomplished, and considering that only two drills of small size were used, it is an extraordinary record. The following certificate verifies the accuracy of the report:

Engineering Department, Colorado Midland Railway Company,
Office of Tunnel Engineer,
MANITOU SPRINGS, Colo., March 22, 1886.

F. W. Dashe, Esq., Supt. of Tunnels Nos. 5 and 6, Manitou, Colo.:

DEAR SIR: Herewith I certify that your week's drive at the East heading of Tunnel No. 5 for the week ending November 17th, according to accurate measurements of the 10th and 17th of November, was 98¼ (ninety-eight and one half feet). Section of heading being 8 feet by 16 feet. Character of rock, red granite.

(Signed) WILLIAM BEHRENS,
Engineer in Charge of Tunnels.

THE PRODUCTION AND CONSUMPTION OF COPPER IN 1886.

We are indebted to the courtesy of Mr. Charles Kirchhoff, Jr., agent for the Division of Mineral Statistics of the United States Geological Survey, for the following statistics of the production of copper in the United States in 1886:

The following estimate, compiled from the direct returns of producers, supplemented by valuable statements from the copper refining works, while subject to some revision in minor details, may be accepted as substantially correct. The difficulty in territorially distributing the product and avoiding duplications is growing constantly with the interchange of ores, mattes, and pig from one locality to another. The diversion of a part of the copper product into bluestone manufacture is an additional complication.

Of the total product of 156,373,421 pounds of Domestic copper, fully 1,500,000 pounds are known to have been used for bluestone manufacture. Of the total product of, roughly, 156,400,000 pounds, not less than 136,820,943 pounds were turned out by American refining works, including a small quantity of blister exported by such, and small amounts of unrefined copper going directly to consumers. Deducting from this the exports, 19,504,087 pounds, there remain over 117,000,000 pounds available for home consumption, of which about 64,000,000 pounds were Lake, and the balance, 53,000,000 pounds, were from other sources, Arizona contributing about 16,000,000 pounds, and Montana the bulk of the rest. The exports of matte and ore amounted to 20,876 gross tons, which, at 57½ per cent fine, would represent about 27,000,000 pounds. A small part of this is matte from the smelting of burnt Canadian pyrites. An important part of it is 1885 product in transit at the beginning of the year 1886, in excess of material on the way to England in the opening of the current year. The 1886 receipts in Great Britain were 25,173,120 pounds fine, to which must be added an unknown, though small, quantity to the Continent. In the absence of an exact statement of the fine copper contents of matte and ore exported, and the wide fluctuations in the quantity in transit at any particular time, a balance can not be struck between product, quantity retained for home consumption, and amounts exported.

COPPER PRODUCTION OF THE UNITED STATES IN 1886.

	Pounds.		Pounds.
Lake Superior	79,728,838	Maine, New Hampshire and Vermont	315,719
Arizona	15,657,035	Southern States	29,811
Montana	57,611,621	Middle States	
New Mexico	558,385	Lead desilverizers, etc.	1,282,496
California	430,210		
Colorado	409,306	Total domestic copper	156,373,421
Utah	300,000	From imported pyrites and ores	4,500,000
Wyoming			
Nevada	50,000	Grand total production	160,873,621
Idaho			
Missouri			

The important features in the copper trade of the United States in 1886 have been the continued increase in the output of Lake Superior and the falling off of Arizona and Montana, the sharp decline in the quantities exported, and, above all, the notable increase in the quantity of copper which sought the more remunerative home market. Coupled with this tendency to overstock the home trade in the face of a declining output, is the important fact that the quality of miscellaneous grades has improved, and that consumers have learnt to better utilize relatively lower grades of copper.

CONSUMPTION.

While the local supply has increased, the consumption in this country has, on the other hand, developed again in the most satisfactory manner. Like in the past year, this office has received confidentially a statement from the majority of the leading manufacturers of copper and brass in its different forms, the following firms sending replies:

Ansonia Brass and Copper Co., Ansonia, Conn.
Baltimore Copper Smelting and Rolling Mill Co., Baltimore, Md.
Bridgeport Brass Co., Bridgeport, Conn.
Bristol Brass and Clock Co., Bristol, Conn.
Cheshire Brass Mfg. Co., West Cheshire, Conn.
Coe Brass Mfg. Co., Torrington, Conn.
Detroit Copper and Brass Rolling Mills, Detroit, Mich.
De Witt Wire Cloth Co., New York.
Haydenville Mfg. Co., Haydenville, Mass.
Hendricks Brothers, New York.
Holmes, Booth & Haydens, Waterbury, Conn.
C. G. Hussey & Co., Pittsburg, Pa.
Landers, Frary & Clark, New Britain, Conn.
E. Miller & Co., Meriden, Conn.
New Bedford Copper Co., New Bedford, Mass.
New Haven Copper Co., Seymour Conn.
Peck Brothers & Co., New Haven, Conn.
Peck, Stow & Wilcox Co., Southington, Conn.
Plume & Atwood Manufacturing Co., Thomaston and Waterbury, Conn.
J. A. Roebling's Sons Co., Trenton, N. J.
Russell & Erwin Manufacturing Co., New Britain, Conn.
Rome Iron-Works, Rome, N. Y.
Scovill Manufacturing Co., Waterbury, Conn.
Seymour Manufacturing Co., Seymour, Conn.
Taunton Copper Manufacturing Co., Taunton, Mass.
United Brass Co., Lorain, Ohio, and Haydenville, Mass.
Wallace & Sons, Ansonia, Conn.
Washburn & Moen Manufacturing Co., Worcester, Mass.
Waterbury Brass Co., Waterbury, Conn.
Yale & Towne Manufacturing Co., Stamford, Conn.

In the aggregate these works consumed in 1886 60,886,749 pounds of ingots, slabs, cakes, and bars, against 49,483,847 pounds in 1885. This indicates an increase of 22·8 per cent. It should be stated, however, that the returns include a number of wire drawers whose consumption has developed in a phenomenal manner, thus probably making the rate of increase in consumption appear greater than it would be if the figures were available for the entire trade. Care has been taken to avoid the duplication which might grow out of the fact that considerable copper is handled in successive stages of manufacture by different concerns.

NEW YORK, March, 14, 1887. C. KIRCHHOFF, JR., Agent.

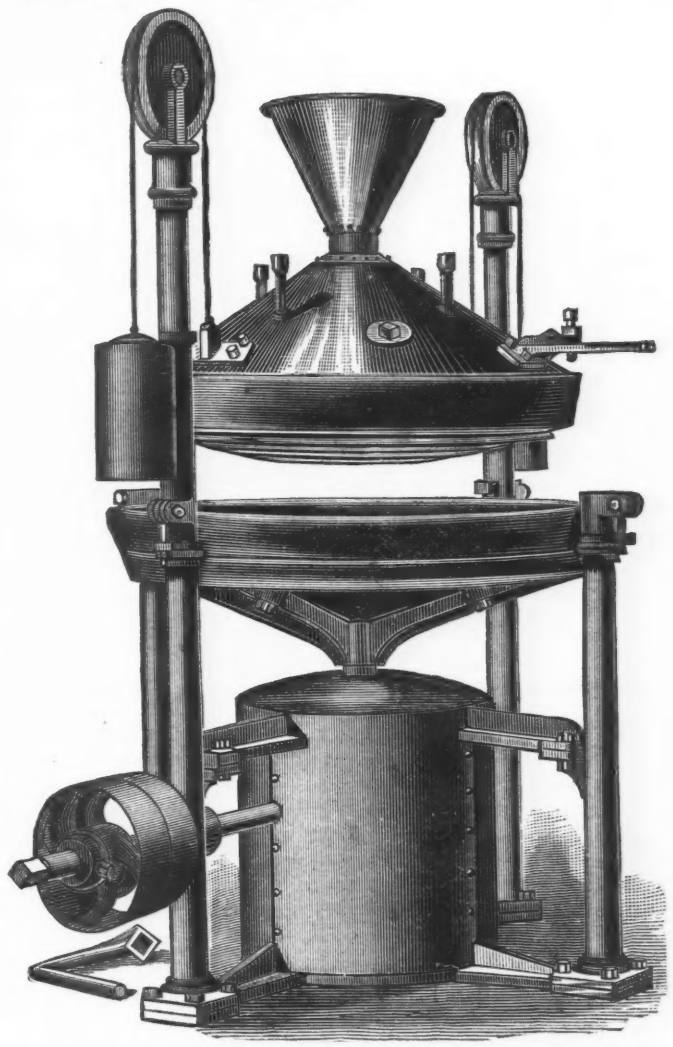
A NEW CENTRIFUGAL AMALGAMATOR.

Next to the discovery of productive gold mines, there is certainly nothing of greater importance than the invention of machinery for the cheap and rapid extraction from the ores of that portion of the precious metal that happens to be free.

Innumerable devices have been suggested and patented in this country to attain the desired end in dealing with ores of low-grade; but, although the results of the "Homestake" may be pointed to as a monument of success, there is still plenty of room for the development of inventive genius in the direction of "placers," and the thorough elimination of gold-dust from sand.

Enormous tracts of "placer" ground, containing incalculable millions in free gold, are allowed to remain undisturbed, from the simple fact that the cost of exploiting them with any known machinery would far exceed the value of the return, and there can be no doubt that the lucky inventor of a machine which shall be not merely theoretically applicable but industrially successful in the field, will soon find himself hoisted to fortune "on his own petard."

The cut we give below, illustrates a new centrifugal amalgamator we have just been called upon to inspect at the carriage factory of the patent owners, Messrs. J. B. Brewster & Co., in this city, and it certainly seems well calculated to do great things.



The ore to be treated, passes by means of an automatic feed through the hopper in the stationary disk, the bottom of which is covered with a series of broken riffles.

Directly beneath this disk, is a revolving pan containing a reservoir of quicksilver, and when the apparatus is set in motion the disk is lowered to within $\frac{1}{16}$th of an inch of the bottom of the pan, upon the bottom of which the quicksilver spreads and forms a wall round the periphery.

A very thin, small stream of water suffices to moisten the sand or ore ere it falls through the hopper into the center of the pan, where, as soon as it arrives, it is forced backwards, and forwards, between, and under the riffles. The object aimed at is to free the gold from the sand or quartz by difference in specific gravity, and to so brighten it that it will immediately amalgamate in coming in contact with the mercury; itself kept bright with the action of the riffles.

The construction of the machine is entirely devoid of complication, and it is asserted that each will treat about one ton of ore per hour, at a maximum expenditure of one half a horse-power.

We have not seen this interesting contrivance at work, but we are informed that a series of tests lately made in North Carolina, with crushed ore and sand, containing, besides a small quantity of gold, a large percentage of magnetic iron, resulted, according to comparative assays, in a successful recovery of all the gold, *with no loss of quicksilver*. We underline this portion of the statement, because, if it prove to be exact it is, beyond controversy, the key to the situation.

We hope in a few days to witness some experiments that are to be made with various grades of gold-bearing sand and crushed ores, and shall then be in a better position to pronounce upon its merits.

THE COPPER ORE DEPOSITS NEAR MORENCI, ARIZONA.

Written for the Engineering and Mining Journal by Carl Henrich, M.E.

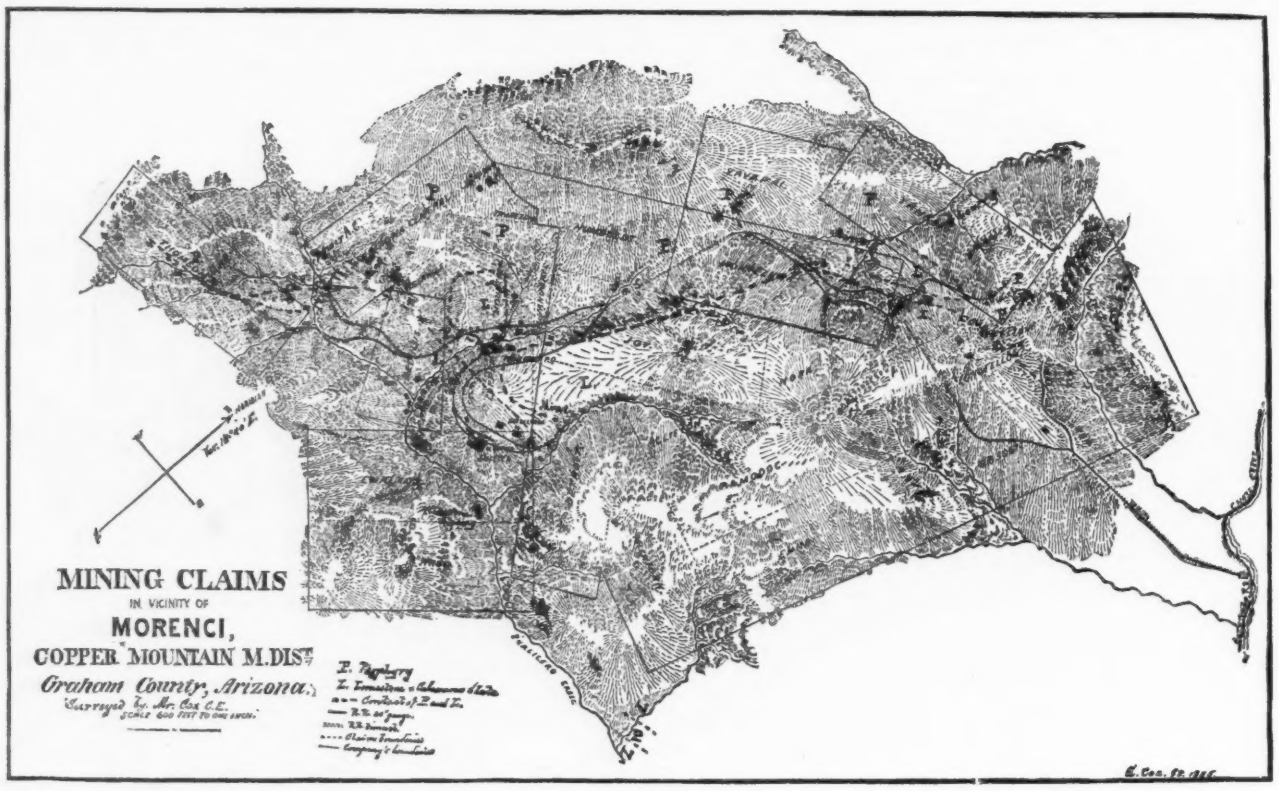
Morenci is the name given to the mining camp, in and around which are located the mines and smelting-works of the Detroit Copper Company of Arizona, and near which are also located the well-known Longfellow Mines of the Arizona Copper Company, whose smelting-works are located at the town of Clifton, on the San Francisco River, seven miles distant from Morenci. Besides those mines, there are several other producing copper mines in the district. The different forms of ore-deposits of all these mines may be divided into three distinct classes.

1. *Contact Deposits.*—The ores found in these deposits are oxidized. The main copper ores which are present in this class of deposits are malachite, azurite, cuprite, which latter frequently contains some metallic copper and some malaconite. Besides these copper ores, these deposits contain limonite and manganese ores, chiefly wad. Limonite frequently constitutes the main body of the ore-deposit, and the copper ores, in this case chiefly the carbonates, are disseminated in the iron ore in larger or smaller pockets and veins. The ore may be said to change from a ferruginous copper ore to a cupriferous limonite or wad. Some ore-bodies of this class are formed of solid limonite, containing only a trace of copper. Some of the bodies of iron ore contain only a small percentage of silica and afford then, a good iron flux for the smelting of the more siliceous ores of the district. In other places, they get more siliceous and gradually change into a fine-grained very siliceous rock. The ore-deposits of the Yankie mine, belonging to this class, are ferruginous copper ores, while the main ore-body of the Copper Mountain contact deposit, is a cupriferous limonite, with large pockets and seams of high-grade carbonate ores of copper. The contact deposits of the Montezuma and Yavapai mines occupy an intermediate position, and the ore-bodies cropping out on the Joy claim along the line of contact, change from a very pure limonite to a ferruginous quartz-rock.

All these deposits occur in a zone of decomposed, kaolinized porphyry, between a bluish fine grained limestone as a foot-wall, and solid porphyry, as a hanging-wall. Many, and probably the most, extensive of these ore-bodies are found directly on the limestone. Other and large ore-bodies of the same nature have been found, however, entirely surrounded by the decomposed porphyry. Large and small boulders of limestone are also frequently encountered in this zone of decomposed porphyry, and next to these limestone boulders, and in direct contact with the same, ore-bodies have been found. The limestone, forming the foot-wall in the contact deposit of the Copper Mountain mine, seems to be such a boulder, of abnormal size, about 400 × 500 feet in horizontal section. Another huge limestone boulder of a rough triangular horizontal section, about 700 × 200 feet, seems to form the foot-wall for some of the contact ore-bodies in the Yankie and Yavapai claims. The general map of the mining claims around Morenci (Fig. 1), on which the outcrop of the contact between the limestone and porphyry, as far as known to the writer, has been marked, will give a good idea of the broken and split up nature of the contact between the porphyry and the sedimentary rocks. The sections through the Copper Mountain mine and the Yankie mine (Figs. 2 and 3) will give some idea of the occurrence, and the shape and size of these ore-deposits.

2. *Deposits in the Limestone.*—These are, in contents and general character, very similar to the contact deposits just described. There seems to be present in them a larger amount of wad, and they also usually contain a larger amount of lime than the contact deposit ores. Wherever these deposits have been worked out, an ore-channel connecting them with the contact zone has been found. Where this has not been the case, it has been for the reason that the porphyry overlying the limestone has been removed in former ages, and the deposits formerly inclosed in the limestone had been brought to the surface of the ground. Such had been probably the case with the immense limestone deposits of the Longfellow mine. But even these deposits have been found to connect with the contact deposit of the Yankie mine, depicted in Fig. 3. These deposits, as we shall see later on, really belong to the same class as the contact deposits.

3. *Deposits in Porphyry.*—These deposits occur in sheets and pockets, or impregnated in the solid porphyry rock. When near the surface and exposed to the oxidizing influence of the atmosphere, they often contain oxidized ores, chiefly malachite, sometimes azurite and small quantities of chrysocolla and chalcanthite. This latter ore frequently forms in the old drifts of these mines, and is then associated with alunogen in silky, efflorescent crystals. When these deposits are farther removed from the influence of the atmosphere, they generally contain a nucleus of chalcocite. When beyond the reach of the atmospheric influence, the ore is mainly chalcocite, which occurs in sheets or masses, or impregnated in



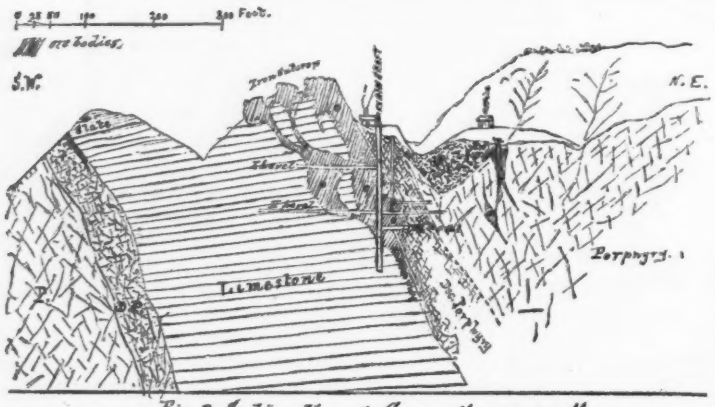


Fig. 2. Section through Copper Mountain Mine.

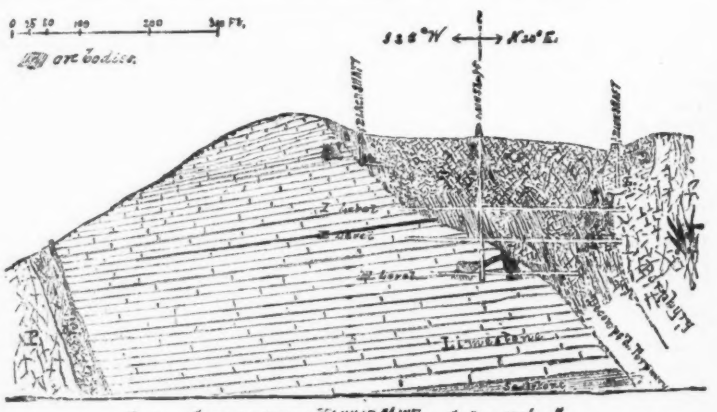


Fig 3 SECTION THROUGH YANKIE MINE. Scale: 150' = 1"

the porphyry rock, in the same manner in which, in the deposits near the surface, the malachite occurs, so that the change from the sulphuret to the oxidized ore has taken place *in situ*. Besides these deposits of copper glance, chalcopyrites and pyrites have been found deposited in the fissures of the porphyry, or impregnated in the porphyry rock; and in other places, the porphyry rock has been found stained with iron rust, and sheets of limonite with a nucleus of pyrites have been found in the crevices of the porphyry.

These deposits of copper glance and carbonate of copper in the porphyry, occur, as already stated, in different forms and shapes, and are of very varying extent. On the north part of the Arizona Central claim, a pocket of malachite has been found, from which thousands of tons of ore containing about 30 per cent metallic copper have been extracted. This deposit was in the shape of a large irregular chamber. At the southwest corner of the same claim, another large deposit of malachite in porphyry is found. But here the ore occurs in a multitude of smaller sheets, filling the fissures of the porphyry rock and crossing and interlacing each other in all directions, while in some parts the porphyry rock itself is impregnated with grains of malachite, giving it a green and white mottled appearance. In other places, these deposits resemble and may be called fissure-veins, as doubtless the ore fills the fissure or fissures in the porphyry rock. Still they evidently do not belong to that class of deposits usually understood under the title "fissure veins." No ore connection has been traced thus far between the different neighboring deposits of this kind, and I do not believe, as I shall explain farther on, that any such connection exists. The gangue of the ores of this kind is quite free from iron, only one or two per cent of that element being found in the ore. The main gangue is a kaolinized porphyry, containing a high percentage of alumina. This gangue forms the main obstacle or source of trouble in smelting the ores of this district. The real copper glance ore, of course, can be easily concentrated, and the gangue rock eliminated thereby. But whenever the copper glance has been changed to malachite, it forms a very friable ore, easily crushed to an impalpable powder, which quality must of necessity occasion heavy losses in any concentration of this ore.

THE ORIGIN AND FORMATION OF THE ORE-DEPOSITS.

The sedimentary rocks of the country in which these deposits occur are sandstones, limestones, and slates. They abut, about 1¼ miles east of Morenci, on conglomerate beds about 1500 feet thick and covering an area of about 30 by 20 miles. I consider these conglomerate beds as the area of a former Alpine lake, into which the torrents from the surrounding mountainous country washed the gravel, which now forms the conglomerate. I have been led to this belief by the coarseness of the conglomerate near what must have been the shores of this lake, and the gradual finer grained structure of the conglomerate towards the center of the lake.

Through the sedimentary rocks of this region an immense dike of porphyry broke at some former time, tearing and splitting the edges of the huge fissure, through which the outpourings of the porphyry masses occurred. We find the contact between the limestone and the porphyry near the mines much broken and split, tongues and wedge-shaped masses of porphyry protruding every where into vertical cracks along the edges of the limestone. We find also larger and smaller boulders, and even whole areas of limestone split off from the rest of the limestone country and surrounded by porphyry.

When this outpour of porphyry occurred, it brought with it, probably, the iron and copper of these ore-deposits in the form of copper glance and copper and iron pyrites. At the cooling of the porphyry mass, which, considering the enormous dimensions of these dykes must have been extremely slow, the disseminated iron and copper sulphurets probably concentrated, and finally were deposited in the fissures and pockets of the porphyry, formed by the cooling of the mass. We may assume that they were originally deposited as copper glance and as pyrites deposits, in the same fissures of the porphyry rock in which we find the copper glance deposits and the remnants of the pyrites deposits to-day.

(TO BE CONTINUED.)

Meteoric Iron.—A fifth mass of meteoric iron from Augusta County, Virginia, has been described in the American *Journal of Science* by George F. Kunz. This specimen, which comes from the same place where was found the largest of the three masses first described by Professor J. W. Mallet, F.R.S., yielded, on analysis: Iron, 90·293; nickel, 8·848; cobalt, 0·486; phosphorus, 0·243; carbon, 0·177; with traces of copper, tin, sulphur, silica, manganese, chromium, and chlorine.

Spanish Endless Chain Tramway.—To convey the iron ore from the San Juan mines, in Spain, which lie behind a mountain, to the trunk line, Mr. George Lee, of Redcar, has constructed an endless chain railway two miles in length. From the tips on the trunk line to the summit of the mountain, which is 1712 feet above them, is a distance of 2790 yards—an average gradient of 20·4 per cent; the maximum gradient being 43 per cent. The surplus power on the one side of the mountain is utilized in hauling up the ore from the mine on the other.

"Goliath" Rails.—Some time ago, Mr. C. P. Sandberg read a paper before the Institution of Civil Engineers, pointing out the inadequate weight of the rails used on many continental railroads, and maintaining that the growing dimensions of the traffic required that this feature of railroad economy should be regarded not only from the stand-point of present needs, but also with a view to the increased speed of traveling demanded by the public, and enforced by the competition of the leading lines. We learn that the views then set forth are finding acceptance in Belgium, and that rails of exceptional strength are to be laid down by the administration of the State Railroad on certain busy parts of its system. The Société Cockerill is rolling some hundreds of tons of rails, weighing 50 kilograms per meter (101 pounds per yard), and known as "Goliath" rails. These are of the Sandberg section, slightly modified by M. Flamache, and are intended to be laid down on a section over which it is designed to run trains at a higher speed than hitherto attained If the experiment proves successful, it is hoped that the journey from Brussels to Antwerp will be reduced to half an hour, and that on the Ostend-Verviers line the journey will be effected in three hours.

THE IRON AND STEEL INDUSTRY.

From the official returns just published by the British Iron Trade Association, we gather some very noteworthy figures in connection with the relative production of iron and steel in the United Kingdom and this country in 1886.

The output of pig-iron by our great rival, has shown a marked and continued falling off ever since the year 1882, the total announced by them for last year being only 6,870,665, as compared with our own 6,366,688 tons.

Their production of Bessemer ingots and rails, for the same period, amounted respectively to 1,570,520 and 730,343 tons of each kind; that of the United States being, as we have already shown, 2,541,493 of ingots, and 1,749,899 tons of rails.

These are eloquent figures, no less interesting than gratifying for our manufacturers; for they point out that we have now indeed assumed the leadership of the world in the production of Bessemer steel, and that the predictions of Mr. Swank bid fair to be quickly and literally verified.

The New Boring at the Channel Tunnel Works at Dover has now reached a depth of 500 feet, and the operations, which are made with a view to ascertain whether the geological strata conform with those of the French coast are being continued. No coal has yet been found, and the discovery of this is stated to be one of the objects of the boring.

Aluminum Steel.—The Cowles Electric Smelting and Aluminum Company of Cleveland, O., are now exhibiting what they call aluminum steel. In a sample bar of iron welded to a bar of Siemens-Martin basic steel with one fifth of 1 per cent of aluminum added, no line of weld can be seen, the characteristics of the steel appearing to extend far into the iron. Without the aluminum, a clearly defined weld is visible between iron and the same steel. The same firm show a forged bar of aluminum bronze, with 5 per cent of aluminum; this broke at 36 tons per square inch of original section, with 60 per cent elongation.

A New Metal Industry.—*Kuhlow's* say that in Germany gold, platina, and silver strips are welded, after the mosaic style, upon a metal ground, prepared by the incandescent process, then compressed by means of powerful presses, and finally elongated by rolling into long sheets or strips. These sheets, which are now of all colors—yellow, red, green, white, gray, and black—are made into scarfs and neckties, which, being indestructible, are considered of some practical worth. This novelty, it appears, has found great acceptance abroad, numerous orders for export having been received by the manufacturers, who are chiefly in the Pforzheim and Baden districts.

Method of Ascertaining the Thickness of Boiler-Plates —The *Illustrite Zeitung fur Blechindustrie* calls attention to a method discovered by M. Lebateur for defining the thickness of boiler-plates or other objects where it is difficult to arrive at this information without actual measurement. He spreads a layer of tallow $\frac{1}{10}$ of an inch in thickness upon the metal, and a similar layer upon a piece of known thickness. Both are then subjected for a certain time to the action of a small heated instrument, resembling that used by medical men in cauterization. The tallow melts, and a thick metal is a better conductor of heat than thin metal; the tallow melted upon the thicker plate occupies a greater space than that on the thinner sheet. From the appearance of the two plates the relative thickness is then calculated.

PATENTS GRANTED BY THE UNITED STATES PATENT-OFFICE.

The following is a list of the patents relating to mining, metallurgy, and kindred subjects, issued by the United States Patent-Office.

PATENTS GRANTED TUESDAY, MARCH 15TH, 1887.

359,290. Manufacture of Crank-Shafts. James B. Stanwood, Cleveland, Assignor of one half to the Lane & Bodley Company, Cincinnati, Ohio.
359,310. Means for Fastening Objects to Iron Beams. Carl B. Axt, Chemnitz, Saxony, Germany.
359,315. Pressure Regulator for Water Supply Mains. Dewitt C. Cregur, Chicago. Ill.
359,319. Process of Uniting Metals. Fred A. Godfrey, Holyoke, Assignor to George F. Pottle, West Medford, Mass.
359,335. Manufacture of Gas. Alfred Taylor, New York, N. Y.
359,337. Compound Ingot. Elbridge Wheeler, Boston, Mass., Assignor to himself, Ware B. Gay, and George W. Gogin, trustees, all of same place.
359,348. Mechanism for Forming Ingots, Bars, Rods, etc., from Fluid Metal. Fred H. Daniels, Worcester, Mass.
359,349. Apparatus for Casting Ingots, Bars, etc. Fred. H. Daniels, Worcester, Mass.
359,352. Manufacture of White Lead. Edward V. Gardner, London, County of Middlesex, England.
359,357. Process of and Apparatus for Refining Hydrocarbon. Edward D. Kendall, Brooklyn, N. Y.
359,383. Boiler Tube Cleaner. Charles T. Bower, Philadelphia, Pa.
359,410. Art of Manufacturing Wire Rope. James B. Stone, Worcester, Mass.
359,418. Lubricant. John B. C. Barbanson, San Francisco, Cal.
359,423. Process of Making Barium Dioxide. Arthur Brin, Paris, France, Assignor to the Continental Oxygen Company, Limited, London, England.
359,424. Apparatus for Obtaining Oxygen from Air. Leon Q. Brin and Arthur Brin, Paris, France, Assignors, by Mesne Assignments, to the Contenental Oxygen Company, Limited, London, England.
359,483. Mold for the Production of Metallic Castings. Joseph Whitley, Leeds, County of York, England.
359,485. Wire-Barbing Machine. Oscar J. Ziegler, Freeport, Ill., Assignor to the Stover Manufacturing Company, same place.
359,491. Primer for Igniting Explosives. Louis Bagger, Washington, D. C., Assignor of one half to August Peterson, same place.
359,495. Ore and Rock Crushing and Pulverizing Machine. Hezekiah Bradford, Philadelphia, Pa.
359,498. Separator. William L. Card, La Crosse, Wis., Assignor to the Tierra Seca Mining Company, St. Louis, Mo.
359,500. Pipe-Coupling. William G. Davis, Pittsburg, Assignor of one half to Alvin W. Campbell, Allegheny City, and Enoch Davis, Pittsburg, Pa.
359,508. Pile for Skelp Iron. William G. Howell, Philadelphia, Pa., Assignor of one-third to George H. Boker, same place.
359,517. Hoisting Apparatus for Mines. Townsend Poore, Scranton, Pa.
359,522. Nail-Machine. Daniel C. Stover, Freeport, Ill., Assignor to the Stover Manufacturing Company, same place.
359,552. Electric Igniter for Gas-Engines. Norman C. Bassett, Chicago, Ill., Assignor to William E. Hale, same place.
359,564. Wire-Nail Machine. Henry B. Happe, Beaver Falls, Pa., Assignor of one fourth to Charles W. Rohrkaste, same place.
359,578. Combined Hand and Engine Power Rock-Drilling Machine. John C. Stevens, Portchester, N. Y., Assignor to Pond, West & Simons, same place.

RE-ISSUES.

10,818. Mining Machine. Benjamin A. Legg, Columbus, Ohio, Assignor to the Lechner Manufacturing Company, same place.

METALLURGY OF STEEL.[a]

By Henry M. Howe.

(*Continued from page* 188.)

The supposition that the brittle Fe_3C is simply mechanically mixed with the remainder of the iron is wholly compatible with the malleableness of the whole; we have a parallel case in a copper ingot which Percy describes,[b] which was malleable, though it contained 22 per cent of tungsten, which he states was certainly simply mechanically diffused through the copper.

§ 12. EVIDENCE OF OTHER COMBINATIONS OF CARBON WITH IRON.—Dudley[c] in certain cast-irons distinguishes besides graphite two forms of carbon, one combined with iron to form a gray carbide, the other apparently quite distinct from this carbide. To the latter he gives the name *strength carbon*. Unfortunately he has neither determined the quantity nor the composition of this carbide. Whether either of the forms of combined carbon which he distinguishes are identical with those distinguished by Abel in steel is uncertain. As they have not been recognized in steel, they are not of especial moment for our present purpose.

The endeavors of several investigators to prove the existence of other definite combinations of iron and carbon have not been supported by sufficient evidence to command general acquiescence. Tunner (Ledebur, Handbuch, p. 240), regarded the combined carbon as in the condition of Fe_4C, which in iron with but little carbon was mixed with pure iron. Gurlt regarded gray cast-iron as an octocarbide mixed with graphite, and white cast-iron as a tetracarbide, formed at a low heat and resolved at a higher one into octocarbide and graphite.

§ 13. COMPOUNDS OF C WITH ELEMENTS OTHER THAN IRON.—S. A. Ford on dissolving cast-iron in boiling HCl in an atmosphere of CO_2 obtains a flocculent yellowish residue,[d] decomposed by hot potash solution with separation of a black varnishlike mass (separated carbon?). He regards it as a compound of carbon and silicon.

Shimer,[e] on dissolving cast-iron in HCl, finds in the residue minute non-magnetic cubes, usually perfect, $\frac{1}{1800}$ to $\frac{1}{7000}$ inch thick; Sp. Gr. 5·1; soluble in HNO_3; unaffected by HCl, (apparently) by strong boiling caustic potassa, and by prolonged heating at bright redness in H; and consisting of TiC, with 12 per cent of apparently mechanically mixed foreign matter.

§ 14. THERMAL RELATIONS OF THE COMPOUNDS OF CARBON AND IRON.—Osmund's[f] results indicate that when iron and carbon unite heat is evolved, as in the formation of so many other chemical compounds. They suggest, though equivocally, that more heat is evolved when carbon combines with iron in the cement state than when it unites with it in the hardening state. Troost and Hautefeuille's[g] results appear to directly contradict these, and indicate that the combination of iron and carbon is attended by absorption of heat, as in the formation of explosive compounds. The matter appears to need further investigation. Osmund's results are as follows:

RISE OF TEMPERATURE, ON DISSOLVING IRON.

Percentage of carbon.		0·17	0·54	1·17 tool steel.	4·10	white cast-iron
Absolute rise of temperature in degrees centigrade..	Annealed.....	2·151	2·111	1·895	1.419	
	Cold-forged..	2·247	2·207	2·018	.....	
	Hardened....	.....	2·222	2·056	1·632	
Rise of temperature relative to that of the annealed state.	Annealed.....	1	1	1	1	
	Cold-forged.	1·045	1·045	1·065	.....	
	Hardened	.....	1·052	1·084	1·150	

Both in annealed and hardened steel the higher the carbon the less heat is evolved when the metal is dissolved in a calorimeter, hence it is inferred that splitting up the union between iron and carbon causes an absorption of heat, and consequently that their union had been accompanied by evolution of heat.

In each case the hardened metal, with its carbon largely in the hardening state, gives out more heat than when annealed, and with its carbon chiefly in the cement condition. This might be thought to imply that the passage of carbon from the cement to the hardening state was accompanied by absorption of heat, were it not (1) that the heat evolved by cold-forged steel exceeds that evolved by annealed steel almost as much as that evolved by hardened steel does; and Abel has shown that cold-forging does not cause carbon to pass to the hardening state: and (2) that the excess of heat evolved from hardened over that evolved from annealed steel is far from being proportional to the percentage of carbon. In case of cold-forged steel this excess is the same whether 0·17 or 0·54 per cent C is present, and in the case of hardened steel it is only 60 per cent greater with 1·17 than with 0·54 per cent C. These anomalies suggest that the variations in the evolution of heat caused by hardening, annealing, etc., are due to some other effect than the variations in the condition of carbon.

Troost and Hautefeuille found that carburetted iron evolved more heat when dissolved than iron nearly free from carbon.

§ 15. THE DISTRIBUTION OF THE CARBON between the graphitic, cement, and hardening conditions, *i. e.*, the proportion of the total C found in each state, depends chiefly, 1, on the total amount of carbon present; 2, on the conditions under which the iron has been exposed to a high temperature and subsequently cooled; 3, on the presence of certain other elements, notably sulphur, silicon, and manganese; 4, perhaps on other imperfectly understood conditions. Akerman, Caron and Barba consider that pressure causes carbon to pass from the cement to the hardening condition even at low temperatures; but this conclusion is not warranted by their evidence, and is strongly opposed by Abel's[h] demonstration that in ordinary cold-rolled steel almost all the carbon is in the cement state in spite of th enormous pressure which arises in cold rolling. (See § 56.)

IN GENERAL the formation of graphite is favored by a high total percentage of carbon, by long exposure to a very high temperature (say 1,500° C.), and by the presence of silicon; and it is opposed by the presence of sulphur and manganese. The formation of cement carbon is favored by slow cooling, and that of hardening carbon by rapid cooling from a red heat.

§ 16. EFFECT OF TOTAL PERCENTAGE OF CARBON.—GRAPHITE VS. COMBINED CARBON. Under like conditions, the more carbon is present the larger apparently is the proportion of the total which escapes from combination

[a] Copy-right by the Scientific Publishing Company, 1887.
[b] *Journal of the Iron and Steel Institute*, 1885, Vol. I., p. 34.
[c] *Trans. Am. Inst. Mining Engineers*, XIV., 1886, p. 798.
[d] *Trans. Am. Inst. Min. Engrs.*, XIV., 1886, p. 939.
[e] *Trans. Am. Inst. Min., Engrs.*, 1887, XV.
[f] *Comptes Rendus*, C., 1885, pp. 1228, 1231.
[g] *Metallurgical Review*, Vol. I., p. 177.
[h] *Trans. Institution Mechanical Engineers*, 1881, p. 696.

TABLE 1.—SILICON AND CARBON.

	c 1	a 2	c 3	a 4	c 5	a 6	a 7	a 8	a 9	a 10	c 11	c 12	a 13	d 14	a 15	h 16
Combined C	.....	1·6	.....	1·90	.....	1·85	1·71	0·56	0·68	0·80	.....	.....	0·20	.....	0·37	0·79
Graphite	.....	0·38	.....	0·10	.....	0·24	0·50	1·62	1·19	1·43	.....	.....	1·81	.....	1 66	2·59
Total C	5·59	1·98	5·79	2·00	5·69	2·09	2·21	2·18	1·87	2·23	4·68	4·55	2·01	3·65	2·03	3·38
Si	0·12	0·19	0·43	0·45	0·87	0·96	1·37	1·96	2·51	2·96	3·30	3·35	3·92	4·58	4·74	5·13
Mn	70·10	0·14	68·64	0·21	79·36	0·26	.....	0·60	0·75	0·70	44·64	48·20	0·84	27·13	0·95	0·77
P	.....	0·32	.....	0·33	.....	0·33	0·30	0·28	0·26	0·34	.....	.....	0·33	.....	0·30	1·12
S	.....	0·05	.....	0·05	.....	0·04	0·05	0·03	0·05	0·04	.....	.....	0·03	.....	0·05	0·17

	h 17	h 18	b 19	d 20	a 21	c 22	d 23	c 24	b 25	d 26	a 27	f 28	e 29	g 30	g 31
Combined C	0·71	0·00	0·58	.....	0·38	.....	.....	.....	0·00	.....	0·69	.....	.....	0	0
Graphite	2·68	2·88	2·38	.....	1·48	.....	.....	.....	1·94	.....	1·12	0·60	.....	0	0
Total C	3 39	2·88	2·96	3·01	1·86	2·42	2·13	2·72	1·94	1·74	1·81	.....	0·79	0	0
Si	5·13	5·47	5·92	6·72	7·33	8·33	8·81	9·19	9·50	9·75	9·80	15·10	15 38	20	23
Mn	0·56	1·54	1·09	25·70	1·36	2·11	28·89	24·36	1·20	30·14	1·95	.....	3·42	.....	.....
P	1·12	0·60	0·14	.....	0 29	.....	.....	.....	0·11	.....	0·21	.....	0·11	.....	.....
S	0·23	0·04	0·03	.....	0·03	.....	.....	.....	0·02	.....	0·04	.....	0 09	.....	.....

a, T. Turner, *Jour. Iron and St. Inst.*, 1886, I., p. 174 ; *b*, Zaboudsky, *Idem*, 1884, I., p. 298 ; *c*, *Idem*, 1883, II., p. 780 ; *d*, Stöckman, *Idem*, 1883, I., p. 415 ; *e*, Percy, *Idem*, 1877, I., p. 164 ; *f*, Lawrence Smith, *Idem*, 1880, I., p. 332 ; *g*, E. Riley, *Idem*, 1882, I., p. 121 ; *h*, E. Hart, *Am. Inst. Min. Engrs.*, V., p. 164.

and becomes graphitic. Witness the readiness with which under favorable conditions 70 per cent, and even occasionally 90 per cent of the total carbon becomes graphitic in highly carburetted cast-iron. In steel with say 1 per cent carbon we can still find graphite, but the amount is small while the separation of graphite from ingot iron would probably be difficult if not impossible.

CEMENT VS. HARDENING CARBON.—The conditions under which carbon passes from the cement to the hardening condition and back are so complex that the influence of the total percentage of carbon on the proportion of the combined carbon which passes into the cement and the hardening state respectively is masked by the influence of other variables. It probably cannot be traced without further experimental evidence. The softness of graphitic cast-iron suggests that, when the total carbon is very high, the combined carbon passes rather into the cement than the hardening state. The graphite indeed lessens the strength and hardness of the iron as a whole, but we can hardly ascribe to it the softness of the individual crystals which we observe ; these it simply encompasses. But the occurrence of the carbon in such iron in the cement state may be due to other causes than the total percentage of carbon ; for example, to the presence of silicon, slow cooling, etc.

§ 17. EFFECTS OF SILICON, SULPHUR AND MANGANESE ON THE PROPORTION OF GRAPHITE TO TOTAL COMBINED CARBON.—In general, silicon forces carbon out of combination and into the graphitic state ; manganese and sulphur (and perhaps phosphorus) have the opposite effect, favoring the retention in the combined state of all the carbon which the iron contains.

§ 18. SILICON appears not only to oppose the union of carbon with molten iron, but (at least when present in quantities exceeding 1·37 per cent) to oppose to a still higher degree its union with solid iron, to force the carbon out of combination and into the graphitic state. Graphitic cast-irons generally contain much silicon ; if this be removed they become white, and their graphite is converted into combined carbon. Thus, in the Bell-Krupp purifying process (pig washing), if a highly graphitic iron be melted and brought in contact with iron-oxide, nearly the whole of its silicon is oxidized before any considerable percentage of carbon has been. If the iron be removed and allowed to solidify after but a brief contact with the oxide, it is found to have become perfectly white.

In the old finery process the same conversion of gray into white iron occurs. It may be observed in the Bessemer process, in which the iron, after it has been blown but a few minutes, during which much of its silicon but very little of its carbon is removed, becomes white. A spiegel with 5·39 per cent Mn and 0·37 Si, which Percy melted in a clay crucible, took up 2·91 per cent Si from the crucible and became gray.[a]

If we examine cast-irons which are tolerably well saturated with carbon and silicon we find that, as the silicon rises the total carbon (which is the percentage with which the iron combines when molten) falls, while the combined carbon (the percentage which the iron is able to retain in combination after solidifying) falls still more rapidly, at least when the silicon exceeds 1·37 per cent. Hence the ratio of graphite to combined carbon rises rapidly with the rising silicon, so rapidly indeed that, for a while, the absolute percentage of graphite actually rises, in spite of the decline in the total carbon, though later the graphite in turn declines. Some of these effects may be traced in Table 1 and Fig. 1. We may consider them under two heads, (A) Turner's results and (B) the others. Considering the latter first, we note that passing in Table 1 from left to right, the silicon gradually increases ; the combined carbon diminishes ; the total carbon diminishes after the silicon reaches 6 per cent ; the graphite at first increases as the combined carbon diminishes, but later on as the total carbon in turn diminishes the graphite declines.

The effects thus caused by increasing silicon do not appear here with perfect regularity, since they are in some cases obscured by those of manganese and other variables which will shortly be referred to. In Fig. 1 these results are graphically shown. In each instance in which both total and combined carbon are given, I have joined their spots with a line, whose length indicates the percentage of graphite present; this, in irons approximately saturated with carbon and silicon probably reaches a maximum with about 4 to 5 per cent Si. In Fig. 1 the graphite evidently declines as the silicon rises above 6 per cent.

TURNER'S RESULTS.—By melting together in various proportions cast-irons whose compositions (including total C) were closely alike, excepting that one was rich in silicon, while the other had but little,[b] Turner obtained a series of irons in which silicon was practically the only variable. Unlike the other results here given, Turner's throw no light on the effect of silicon on the total quantity of carbon which iron will take up, since his irons were far from saturated with carbon ; but they show the effect of varying percentages of silicon on the distribution of carbon be-

[a] Akerman : *Engineering and Mining Journal*, I., 1875, p. 288.
[b] *Jour. Iron and Steel Inst.*, 1886, I., p. 174.

tween the graphitic and combined states in irons whose total carbon is practically constant.

The curve[a] in Fig. 1 shows his results, which indicate that as silicon rises from 0 to 1 per cent the percentage of carbon held in combination rises; but that as silicon rises from 1 per cent to about 5 per cent it causes the carbon to become more and more largely graphitic; and finally, that as it rises from about 5 per cent to about 10 per cent the proportion of carbon remaining in combination again increases; but as this final apparent rise of combined carbon is due wholly, or nearly so, to a single instance (No. 27), little weight should be attached to it, especially as we find that the total carbon in the other instances continues to decline regularly as the Si rises from 5 per cent to 10 per cent.

Had Turner added silicon to an iron initially saturated with carbon, even the smallest addition would probably have diminished the total carbon and have caused the formation of graphite. His results are, however, valuable as showing that when the total carbon is far below the point of saturation the addition of moderate quantities of silicon may actually increase the proportion of that carbon which remains in combination; the silicon may rise from ·19 to ·96 per cent without increasing the proportion of carbon which becomes graphitic.

§ 19. MANGANESE promotes the union of carbon with iron both in the molten and solid states. Thus we find that highly manganiferous cast-irons (spiegel and ferromanganese) not only contain much more carbon than others, but that their carbon is ordinarily almost wholly in combination. Thus silicon and manganese oppose each other; the former lowers, the latter raises the saturation point for carbon in molten iron, (*i. e.*, the maximum attainable total C), as well as the saturation point in solid iron, *i. e*, the proportion of carbon which can remain combined during solidification and cooling. Whether under given conditions a cast-iron of given total carbon becomes graphitic or white on solidification depends greatly on the relative proportions of carbon, silicon, and manganese which it contains. Thus Pourcel obtained cast-iron with 15 per cent Mn, but actually gray (*i. e.*, graphitic), owing to the presence of a large percentage of silicon, though had the silicon been absent a much smaller percentage of manganese would have sufficed to make the iron perfectly white (*i. e.*, to have held all the carbon in combination).

Conversely Ledebur[b] affirms that with 60 per cent Mn, iron may contain about 5 per cent C, wholly in combination, even in the presence of more than 2·5 per cent Si, a quantity which but for the manganese would render the greater part of the carbon graphitic.

§ 20. SULPHUR, though it appears like silicon to lower the saturation point for carbon in molten iron, and thus to lower the total carbon, yet like manganese prevents the formation of graphite; from which we may infer that, while silicon lessens the power of carbon to unite with iron even more in the solid than in the molten state, so that part of the carbon taken up by the molten iron is separated out as graphite on the solidification of siliciferous irons, sulphur limits the power of molten quite as much as of solid iron to combine with carbon, so that the whole of the carbon taken up by a sulphurous iron when molten is retained in combination during solidification.

[a] This is a "first derived curve" which I have obtained from Turner's results by taking them in groups of three (1st, 2d, 3d, then 2d, 3d, 4th, etc.), and plotting the center of gravity of each group.

[b] "Handbuch der Eisenhutt," p. 236.

The effect of sulphur in preventing the formation of graphite is illustrated by the common observation that while white cast-iron has often more than 0·3 per cent S, we rarely find more than 0·15 per cent S in gray iron, and it is stated that the sulphur in No. 1[c] Bessemer cast-iron cannot exceed ·05 to ·07 per cent. I have, however, analyses of No. 1 iron with 0·12, 0·13, 0·14, and even 0·18 per cent S.

Since the high blast-furnace temperature and the refractory calcareous slags which accompany the formation of graphitic cast-iron at once increase (by temperature) the amount of silicon and diminish (by basicity of slag) the amount of sulphur which passes into the cast-iron, and since the presence and absence of a considerable amount of silicon in gray and white irons respectively suffice to account for the separation of graphite from the one and the retention of the carbon in combination in the other, it might be thought that sulphur did not directly prevent the carbon of white iron from becoming graphitic, but that the presence of sulphur and the freedom from graphite of white iron merely resulted from a common cause, namely, the condition of the blast-furnace. But that sulphur may directly prevent the formation of graphite and cause the retention of all the carbon in the combined state is indicated by experiments of Karsten, and of Smith and Weston in Percy's laboratory, in which adding sulphur to graphitic gray iron turned it white, the carbon in general passing wholly into combination. In one case, the iron contained 5·49 per cent of combined carbon, together with 0·446 per cent S. The presence of silicon of course limits the power of sulphur to retain carbon in the state of combination.

§ 21. PHOSPHORUS is thought to prevent the separation of graphite, but to a much less degree than sulphur and manganese.

§ 22. CEMENT VS. HARDENING CARBON.—It is not yet possible to distinguish the effects of silicon, manganese, sulphur, and phosphorus on the proportion of the combined carbon which passes into the cement and the hardening conditions respectively; indeed, it is not unlikely that, when these elements are present in considerable quantity, they form ternary or even more complex compounds with part of the iron and carbon, so that part, or possibly all, of the carbon is neither in the cement nor the hardening condition as now understood.

§ 23. THE EFFECT OF TEMPERATURE ON THE CONDITION OF CARBON.—The graphite-forming tendencies appear to reach a maximum at a temperature approaching whiteness, the tendencies to form cement carbon at a temperature near dull redness; while where these tendencies fall to their minima, the tendencies to form hardening carbon seem to reach two corresponding distinct maxima, one at or above a white heat, and a second at a temperature somewhat above dull redness. They appear to be complementary to the graphite-forming tendencies at very high temperatures, and to the cement-forming tendencies at lower ones. The existence of these two maxima suggests that what we call hardening, carbon may really comprise two more distinct compounds, all considerably harder than pure iron, and hence not easily distinguished from each other. Each of the supposed maxima of tendencies to form hardening carbon may be simply the maximum tendency to form some one of these as yet undistinguished compounds.

(TO BE CONTINUED.)

[c] Riley: *Jour. Iron and St. Inst.*, I., p. 107.

PERSONALS.

The fifteenth annual meeting of the American Society of Mechanical Engineers will be held at Washington, D. C., about the middle of May.

Mr. E. E. Olcott, mining engineer, of this city, has gone to Colorado on professional business; he will be absent about two weeks.

Mr. Thomas McMaster, who has been prominently connected with mining in this country for many years, died in San Francisco on the 6th inst., aged 64 years.

Mr. E. Gaujot, mining engineer, of Belleville, Ontario, has gone to Arizona on professional business, and will be there for several weeks. Any one wishing to secure his services can address him at Prescott, Ariz.

Mr. James C. Bayles, editor of the *Iron Age*, has been appointed President of the Board of Health of this city, to succeed General Alexander Shaler. Mayor Hewitt and the city are to be congratulated on this excellent selection. Mr. Bayles' past record and his well-known views on professional ethics are guarantee that we may expect an honest and efficient administration of this important office under him.

FURNACE, MILL, AND FACTORY.

The Bickford Drill Company has purchased all the patents, patterns, shop and good will of H. Bickford, Cincinnati, O., and will take possession April 1st.

The Athens Foundry and Machine Shops, Athens, Tenn., are being enlarged, so as to facilitate the manufacture of engines, shaftings, turbine water-wheels, etc.

Work on the plant of the Decatur Iron Bridge and Construction Company, Decatur, Ala., has begun and will be in operation in four months. The company has a capital of one hundred thousand dollars.

The Creosote Lumber and Construction Company, will establish large creosoting works at Fernandina, Fla., for the preservation of piling, cross ties, bridge timbers, etc., etc., for domestic and foreign markets. The plant is now being erected, and will be in operation in about 4 months.

Joseph Hunt, superintendent of the Crane Iron Company, at Catasauqua, Pa., has resigned, to take effect April 1st. He has accepted the management of the Cameron Iron Company, Emporium, Pa. He will at once make preparation for the erection of furnaces at that place, the development of iron deposits, etc.

The nail factory, nail-plate mill, and copper shops of the North Chicago Rolling-Mill Company's plant, at Bay View, Wis., have resumed operations after an idleness of several months. Every other department is running, and for the first time in several years all departments of the works are running full force at the same time.

The production of steel at the Edgar Thomson Steel Works, Braddock, Pa., during the week ended the 12th inst., was greater than that of any previous week since the works were built. The production of ingots was 6061 tons, and of rails 4827. There are now six furnaces in blast, furnace C having been blown in last Saturday. The last new furnace, to be named G, will be blown in about May 1st.

The agency arrangement so long existing between Messrs. Miller, Metcalf & Parkin, of the Crescent Steel-Works, Pittsburg, Pa., and Messrs. Ely & Williams, of New York, has been discontinued by limitation and mutual agreement. Mr. P. H. Patriarche has been appointed manager of Messrs. Miller, Metcalf & Parkin's eastern department, and they will carry a full stock of their steel in their warehouse at No. 480 Pearl street, New York City.

Mr. George R. Waite, who has been connected with the United States agency of the Siemens furnaces for over eighteen years, has become a member of the firm of Waite, Van Harlingen & Mactier, engineers and contractors, Philadelphia, Pa., and will have charge of the metallurgical department of that firm. They are prepared to build complete all classes of steel plants, heating, puddling, tube welding, zinc, chemical, and glass furnaces, and will make a specialty of those of the Siemens type.

No. 1 furnace of the Woodward Iron Company, Woodward, Ala., went out of blast on the 10th inst., after a continuous run of nearly 3 years and 6 months, she having been blown in August 17th, 1883. She made during this time 100,847 tons. Furnace No. 2, having been in blast some six weeks ago, has been blown out for partial relining. It has an automatic feeder, the first in Alabama, and it seems that bad distribution of burden by this caused the stack to cut one side.

H. K. Porter & Co., of Pittsburg, Pa., just shipped two light locomotives for 20 inches of track to Arizona for hauling copper ore; also a very small street motor to California, and a number of contractors, locomotives for work on the new line of the Illinois Central Railroad. They are building a number of motors for New Orleans, and steel works locomotives of different sizes for gauges of track from 23 to 32 inches, and small engines for hauling iron ore and for running larry cars on top of coke-ovens. Among their foreign orders are plantation and special service engines for Venezuela and Ecuador, and a passenger engine for Mexico.

CONTRACTING NOTES.

CONTRACTS OPEN will be found on page xix. New Contracts this week: No. 246, Iron-Works; No. 247, Construction of Jetty; No. 248, Building Main Trunk Sewer; No. 249, Construction of a Dike; No. 250, Iron Bridge; No. 251, Railroad Building; No. 252, Dredging; No. 253, Dredging; No. 254, Water-Works; No. 255, Stone and Iron-Work; No. 256, Iron Bridge; No. 257, Water-Works; No. 258, Supplies for Water-Works; No. 259, Dredging; No. 260, Locomotives.

An artesian well is being sunk at Key West, Fla. Water-works will be built.

Owing to the failure of the Wetherill engines, the Board of Public Affairs, Cincinnati, Ohio, has decided to spend $150,000 for new pumping engines.

The City Council of De Land, Fla., will grant a franchise to contractors for the construction of water-works. Fuller particulars can be learnt from Silas B. Wright, City Clerk.

The Alabama Car Works, Anniston, Ala., have a contract with the East Tennessee, Virginia & Georgia Railroad for 350 cars, and another with the Texas & Pacific Railroad for 400 boxes and stocks.

The Detroit Electrical Works, Detroit, Mich., has just received the contract to build and equip the electric railway at Bellevue, six miles from Pittsburg, Pa., for $16,000.

The city of Minneapolis, Minn., has awarded the contract for 5,000,000 sewer-brick, at $9.25 per thousand, to the Wisconsin Red-Pressed Brick Company.

The Council of Salem, Ohio, has adopted the proposition of Messrs. Turner, Clark & Rawson, of Boston, to build water-works, and will submit it to the people April 4th. The specifications are for a stand-pipe or reservoir of not less than 300,000 gallons.

The Shelby Iron Company and the Brierfield Coal and Furnace Company both contemplate building roads from their works to Calera, Ala., as they want a connection with the Louisville & Nashville system of railroad.

T. W. Horne, of Gadsden, Ala., who has contracted with the Excelsior Electric Company, of New York, for a 25-light plant, desires estimates on 40 horse-power locomotive boiler, 3-inch flues, and a 30 to 40 horse-power automatic engine.

The Navy Department is about to begin the preparation of plans for the two 1700-ton gunboats, for which provision was made by the last Congress. The limit of the contract price of the new vessels is $550,000 each.

The contract for completing the superstructure of the steel arch of the new bridge at Minneapolis, Minn., has been awarded to Horace E. Horton, of Rochester, Minn., at $76,900, on condition that the shop work be done at the works of the Keystone Bridge Company, of Pittsburg, Pa.

The Standard Gas-Light Company, of New York City, owns some 1100 miles of cast-iron gas pipe in that city, which it proposes to tear up and relay with wrought-iron pipe as fast as possible, from this summer on, until the work is completed. There will probably be from 150 to 200 miles laid each year.

Contracts for the building of the Scranton and Wilkes-Barre branch of the Lehigh Coal and Navigation Company's Railroad, which will run from Minocka to Scranton, Pa., and afford an entrance into Scranton for the Central Railroad of New Jersey, were let on the 17th inst. The branch will be fourteen miles in length, and will cost $500,000.

LABOR AND WAGES.

Thomas H. Lyons, of Baltimore, Md., has been awarded the contract for filling 250,000 square yards about the base of the Washington Monument at thirty-nine cents per cubic yard.

Never before in the history of the coal industry in Mercer County, Pa., have the miners evinced such an aggressive disposition as at present. The strike, which at first involved but a few of the small workings, has extended to all sections of the coal-fields, and there appears to be no prospect of a settlement.

The natural gas companies will need considerable pipe during the summer. The Philadelphia Natural Gas will require about 30 to 40 miles of pipe, the Chartiers Valley Company about 10 miles, the Pennsylvania Company about 40 to 50 miles. The Manufacturers' and People's companies have not fully decided as to what extensions they will make, but each has heavy plans under consideration.

Last week, all the mills of the Brooke Iron Company, at Birdsboro', Pa., were closed because of a misunderstanding of one man with the firm. George Brooke, president of the company, issued an address to the men, advising them to leave the Knights of Labor, saying "its laws are more tyrannical than those of the most despotic government." The organization, he said, "was not only doing them no good, but great injury, and was depriving them of work and wages." On the 12th inst, an amicable adjustment was made, and all the mills resumed work on the 14th inst.

The wages of the employés of the Philadelphia & Reading Railroad Company, in Philadelphia, Pa., will be increased from 8 to 15 per cent, to take effect on the 14th inst., and will affect about 500 men, exclusive of those at Port Richmond, and the freight and coal handlers at the depots. It is understood that a similar advance of wages will be granted the employés at other points along the road. It has just been made known, too, that the coal and freight handlers of Port Richmond were advanced 15 per cent at the beginning of the year. This fact has been kept carefully concealed until now, both sides having pledged themselves to keep it quiet.

The railroad coal miners of Western Pennsylvania met at Pittsburg, Pa., on the 15th inst., for the purpose of demanding uniform wages for "dead work," increased pay in mines where large screens have been introduced, and to appoint four delegates to represent them on the Joint Board of Arbitration and Conciliation arranged for at the recent Inter State Convention of operators and miners, held at Columbus, Ohio. The operators also met at Pittsburg to select their representatives on the board, and a joint conference to consider the other questions will probably be held. As both sides show a disposition to compromise, it is thought every thing will be settled amicably. Nothing definite has been done as yet.

Officers of the Amalgamated Association of Miners and Mine Laborers, representing nearly 17,000 colliery operatives, employed in the Lackawanna, Wyoming, Lehigh, and Schuylkill regions, Pa., have met and passed resolutions demanding a higher rate of compensation and an entire abolition of the company store system after the 1st of April. A close and careful investigation reveals the fact that the officials of the Amalgamated Association are quietly preparing the members of that organization for a contest with the mine owners, and it is predicted that within a short time the anthracite districts will witness the greatest labor revolution that has ever shocked the industry. The Knights of Labor will also, it is said, take a conspicuous part in the fight.

GENERAL MINING NEWS.

ARIZONA.

PIMA COUNTY—QUIJOTOA DISTRICT.

The following companies had cash on hand March 1st, as follows: Crocker, $5295.17; Peer, $8215.85; Peerless, $11,993.85.

CALIFORNIA.

CALAVERAS COUNTY.

CALAVERAS GOLDFIELD AND WATER COMPANY, LIMITED.—This company has been organized in London, with a capital stock of £150,000; shares, £1 each.

The company proposes to acquire and work the Wide West gold gravel mines, situated in Elis mining district, and any other property which may seem desirable to acquire in connection therewith.

MONO COUNTY—BODIE DISTRICT.

The following companies had cash on hand March 1st as follows: Bodie Consolidated, $35,020.75; Bulwer Consolidated, $14,756.57; Mono, $17,437.47.

NEVADA COUNTY.

The Pennsylvania Consolidated and the Boston quartz mines, of the Grass Valley District, are reported to have been sold to a Paris syndicate.

CANADA.

PROVINCE OF NOVA SCOTIA.

EGERTON GOLD MINING COMPANY.—The old Hall-Anderson mine is now run by the above company. Work has been started on the McGilligan lead, which is about two feet thick.

PROVINCE OF ONTARIO.

An iron combination is being formed at Chicago with a view to purchasing and controlling the iron deposits in Canada. The Central Ontario Railway, with its iron interests, is to be a part of the combination, and the intention is to extend it 150 miles through the iron district to a junction with the Canadian Pacific Railway at Lake Nipissing. Senator Payne, Stevenson Burke, Erastus Wiman and other prominent capitalists are understood to be interested in the scheme.

COLORADO.

CLEAR CREEK COUNTY.

COLORADO UNITED.—The bank of Georgetown, on the 7th inst., brought suit against this company, otherwise known as the Terrible mines. The suit is for $25,000 on promissory note, and the writ issued from the Federal Courts at Denver. The United States Marshal levied on all the real estate of the company. The suit will not interfere with the active mining operations. It is brought to close some old matters that were held in abeyance during the factional fight on the other side, which resulted in the resignation of Colonel Baldwin as manager and the appointment of Mr. Thomas Cornish, to which we referred in our issue of July 24th.

EDGAR.—This property, situated in Spanish Bar Mining District, was sold at sheriff's sale on the 12th inst., to John B. Smith, trustee, for $9606.91.

PAY ROCK.—The property of this company, including all mines and improvements, was sold at Georgetown, on the 7th inst., as indicated in our last issue, at sheriff's sale for $62,500. It was purchased by Hon. James H. Platt, of New York, the principal bondholder. Mr. Platt owned the Florence concentrating mill, which is connected by tramway with the Pay Rock mines. His purchase unites two properties which will hereafter be vigorously worked and developed.

PLUTUS.—We have been officially advised that the production for February was $5804.04 in gold; $4424.09 in silver; $291.07 in copper; making a total of $10,519.20.

LAKE COUNTY.

We condense the following from the Leadville *Herald-Democrat*:

IRON SILVER MINING COMPANY VS. CROWN POINT AND PINNACLE MINES.—The following cases, all relating to this company's suit, to which we referred in our issues of January 29th and February 5th, came up in the United States Circuit Court at Denver on the 11th inst., and were disposed of as follows: 1524—Iron Silver Mining Company vs. Reynolds et al.; Wells, Moyer placer vs. Crown Point and Pinnacle mines, Leadville; the plaintiff's motion for new trial is denied and judgment is given the defendants for costs.

1529—Chancery. Iron Silver Mining Company vs. Reynolds. Same mines as in 1524; an injunction granted restraining defendants from working.

2075—Chancery. Reynolds vs. Nisi Prius Mining Company et al. Same mines as in 1525; an injunction is allowed against each side, restraining the opposite parties from working the mines.

TIP TOP VS. ENTERPRISE MINING COMPANY.—In the United States Circuit Court in Denver on the 11th inst., this case, to which we referred in our issues of February 12th and 19th, came up and was disposed of as follows: The plaintiffs to remit $19,164.34 of the damages; defendants' motion for a new trial denied, and judgment is entered for $30,000; thirty days are given to file bill of exceptions.

WHITE GULCH MINING COMPANY.—Mr. Tingley Wood and associates have purchased a controlling interest in this company, the property of which comprises 31 acres of patented ground in California Gulch. The consideration is stated to be about $30,000.

PITKIN COUNTY.

DURANT VS. EMMA.—The following cases, all relating to these mines, came up in the United States Circuit Court at Denver, on the 11th inst., and were disposed of as follows: 1949—Hyman vs. Wheeler et al. The defendants' motion for a new trial is denied and judgment is given for the possession of the Emma mine; execution is staid, however, until the first day of the May term of the Court in Chancery. 1829—Hyman vs. Wheeler et al. Rule on defendants and others to show cause discharged, but without costs. 2111—Aspen Mining and Smelting Company vs. Hyman. An injunction is granted restraining the defendants from working.

SUMMIT COUNTY.

JUMBO MINING AND MILLING COMPANY.—This company has been organized in St. Louis, with a capital stock of $2,000,000, to work the Jumbo, the Buffalo, the Jualor, the Buffalo Hoof, the Elliott, and the Big Pittsburg mines and the Eureka placer, which contains thirty-five acres. Upon the property is the Elyria thirty stamp-mill, which is included in the purchase. The officers are Isaac H. Sturgeon, President; John W. Kauffmann, Vice-President; George R. Baker, Secretary and Treasurer; and H. K. Nichols, Manager.

PHILADELPHIA MINING COMPANY.—The Mark Twain mine at Montezuma has been leased to McDonald & McGrath, of Leadville. The mine is being put in shape to take out ore. It is owned by the above company. No work has been done on the property since 1882.

DAKOTA.

PENNINGTON COUNTY.

BIG BEND HYDRAULIC COMPANY.—According to the Rapid City *Journal*, the flume for this company is nearly completed and ready to be turned over by the contractor, William Scott. Superintendent Hastings has increased the working force, making thirty men now employed. Among the improvements to be made on the property is a V flume from Pactola to float ties, cord wood, etc., down to Rapid City. The scheme is pronounced feasible by Mr. Scott. A large amount of placer diggings is owned by the company.

FLORIDA.

WAKULLA COUNTY.

There is said to be an abundance of first-class phosphates in this county. The discovery was first made about one year ago. Work since done shows that they cover a large area of territory. Mr. W. T. Duval of Crawfordville has leased about 16,000 or 18,000 acres of land. A company will be formed to work them.

IDAHO.

ALTURAS COUNTY.

ALTURAS GOLD LIMITED.—At a meeting recently held in London, it was decided that the 60,000 shares of £5 each should be sub-divided into 300,000 of £1 each.

KING OF THE WEST MINING COMPANY.—This company has been organized, with a capital stock of $1,000,000, shares $10 each, to work the King of the West mining claim and the Fawn mining claim, and has purchased King of the West mill-site, all situated in Little Smoky mining district. The officers are: John Q. Packard, President; W. S. McCornick, Vice-President and Treasurer; and Chas. Read, Secretary. The principal place of business will be at Salt Lake City.

ILLINOIS

The following companies have been organized under the laws of this State:

CITY COAL COMPANY.—This company has been organized at Decatur, with a capital stock of $50,000; incorporators, John E. Kinney, Burton B. Tuttle, and Peter H. Brueck.

EUREKA MINING AND SMELTING COMPANY.—This company has been organized at East St. Louis, with a capital stock of $5,000,000; incorporators, Walter Slawson, Ashlin M. White, and John W. Mornaugh.

GOOD LUCK IRON MINING COMPANY.—This company has been organized at Chicago, with a capital stock of $1,000,000; incorporators, Edward F. Mullen, J. Frank Mullen, and Edgar B. Tolman.

ILLINOIS CENTRAL COAL AND SALT COMPANY.—This company has been organized at St. John's, Perry County, with a capital stock of $5000; incorporators, W. P. Halliday, Thomas W. Halliday, and Marion C. Wright.

MANNER MINING AND MILLING COMPANY.—This company has been organized at East St. Louis, with a capital stock of $3,000,000; corporators, J. B. Fisher, E. W. La Beaume, and George Bullock.

KENTUCKY.

HOPKINSVILLE COAL, IRON AND LAND COMPANY.—This company has been organized for the purpose of developing the natural resources of Southwest Kentucky and Northern Tennessee. The capital stock is $500,000, which may be increased to $3,000,000.

MICHIGAN.

COPPER MINES.

The following statement gives the product of the mines mentioned for February and for two months, and a comparison with the outputs of the same mines in the two preceding years:

	February.			Jan. 1 to Feb. 28.		
	1887. Tons.	1886 Tons.	1885. Tons.	1887. Tons.	1886. Tons.	1885. Tons.
Calumet & Hecla	2,316	2 399	2,081	4,972	4,932	4,570
Tamarack	275	300	....	575	374	....
Quincy	208	201	180	402	408	353
Franklin	200	204	183	393	388	385
Atlantic	191	186	116	391	376	341
Osceola	154	166	170	312	331	362
Huron	85	120	112	189	247	231

HURON.—Latest advices from this mine state that the lode in the drift from the fourteenth level is showing copper which will pay to stope. If this productive ground continues from the shaft to the winze, as it seems probable that it will, there will be more ground to stope in the back of this level than has been had in the same locality for the last five levels above it.

OSCEOLA.—At the annual meeting, the following directors were elected: Joseph W. Clark, A. S. Bigelow, Thomas H. Perkins, George F. Bemis, Charles Van Brunt, John N. Denison, and John Daniell. This is the old board, with the exception that Mr. Horatio Bigelow retired, and his place was filled by the election of his son, Mr. Albert S. Bigelow. At a subsequent meeting of the directors Mr. Joseph W. Clark was re-elected president and Mr. A. S. Bigelow treasurer. Extracts from the report which was presented at the meeting we published in our issue of February 19th.

GOLD AND SILVER MINES.

ROPES GOLD AND SILVER MINING COMPANY.—The report presented at the annual meeting shows that 6959 tons of ore were treated during the year ended March 1st. The average yield per ton was $6.20, and the production $4653.92 in silver, and $38,499.93 in gold, giving a total of $43,153.85.

While but little work or exploration has been done to prove the extent of paying ore-bodies both north and south of the present workings, indications show their existence in considerable quantities all through the mine. A cross-cut was driven south from the vein 133 feet east of the shaft, on the 3d level, 43 feet through slate and quartz, the former assaying $10 to $15 in gold, the latter showing coarse free gold running very high. No work has been done on the several levels (except the 5th) to the west of the shaft. In explanation, it may be stated that the veins as shown by the levels above the 6th are small and expensive to mine, and can not be profitably worked while the mine is in course of development.

The only explorations done on the surface were the sinking of two pits in the swamp, 800 feet east of the Curry shaft on the strike of the lode. Owing to the influx of water and the lateness of the season, the work was discontinued.

The superintendent states further that with the promising condition of the mine, and the increased capacity of the mill, the outlook is more promising for the future.

The loss in the tailings ranges from 95 cents to $2.50 per ton, according to the grade of the ore, averaging $1.90 per ton; 80 or 90 per cent of the value being gold.

GOGEBIC RANGE.

ASHLAND.—The sale of this mine, to which we referred in our last issue, has been made to the Penokee & Gogebic Development Company, which owns the celebrated Colby mine. Charles L. Colby, President of the Wisconsin Central Railroad Company, is also made President of the Ashland Company. The Colby, Ashland and Tilden mines will be consolidated under the name of "The Consolidated Colby," with a capital stock of $5,000,000. The former owners retain several thousand shares of stock, and E. O. Hayes is made general manager for the ensuing year.

COLBY.—A new shaft is being sunk near the quarter line on the Colby property, and has been named th

Tilden. The deposit has been drifted into for upward of 200 feet, and proven the cross-cuts to be upward of eighty feet in width.

IRONTON IRON MINING COMPANY.—The stock of this company was listed in Boston this week at $10. We give below a short history of the company, which will be of interest. The company, was incorporated June 20, 1883, under the general laws of Michigan, for the purpose of mining and selling iron ores. The mines are situated in Ontonagon County, Mich., on the Gogebic Range. The capital stock is 40,000 shares, par value $25, non-assessable. The directors are Samuel P. Snider (president), J. W. Pence (vice-president), A. J. Trimble (secretary and treasurer), Nathaniel D. Moore and F. M. Prescott. The principal office is at Hurley.

The Ironton iron mine has a vein 75 feet wide of clean ore, which has been proven across the whole property. Seventeen thousand tons were shipped during the season of 1886 after the date of opening up the mine, July 15, and there is now said to be in sight more than 75,000 tons. In addition to the present equipment, a new plant of machinery, consisting of engines, boilers, etc., is ready for delivery, which will enable the company to add greatly to its output. Already 60,000 tons have been sold for delivery in 1887. The company is out of debt, and is on the line of the Milwaukee, Lake Shore & Western Railroad. They can ship ore to Chicago, Milwaukee, and elsewhere in the winter.

The ore is high-grade, Bessemer quality, running as low as 0.3 in phosphorus, and as high as 63 per cent to 64 per cent in pure metallic iron.

The International Trust Company, Boston, is the transfer-agent.

ORIENT IRON MINING COMPANY.—This company has been organized to carry on operating on the north half of the northeast quarter of section 14, town 47, range 45, west, in the Sunday Lake District. The property is well located, and the company expects to strike the large south vein.

MONTANA.

DEER LODGE COUNTY.

FLINT CREEK MINING COMPANY.—This company has been organized with a capital stock of $2,000,000, shares $5 each, to mine on Flint Creek. The directors are: Sigmond Laier, Leopold Winterhalter, Wm. H. Young, Emil Weinberger, Ernest C. Freyschlag, W. P. Jahnke, Joseph A. Hyde and John F. Forbis.

HOPE.—This company attracts considerable attention owing to the recent rapid advance in the price of the stock. The property is reported to be in a good condition. The mill is working steadily, and shipping regularly, though the shipments are not large. It is also claimed that the ore-body is increasing in size and richness as it is developed, and it is said that on account of these reports from the superintendent a new interest has been awakened.

LEWIS & CLARKE COUNTY.

EMPIRE.—The production for February was $16,500 from 485 tons of ore. The mine is looking well, and development-work as well as stoping is being actively pushed.

MONTANA COMPANY, LIMITED.—The official report for February shows the production to have been $178,700, and the working expenses $51,000, leaving a net profit of $127,700.

SILVER BOW COUNTY.

MOULTON.—Official advices show the production in February to have been $2269 in gold and $47,628 in silver, a total of $49,897.

NEVADA.

ELKO COUNTY—TUSCARORA DISTRICT.

NAVAJO.—The ore that is being extracted from above the 150-foot level is very low grade, and if it does not improve in a few feet stoping will be stopped. In the workings of the 350-foot level, there is no material change.

ESMERALDA COUNTY

HOLMES.—The company's statement March 1st show cash on hand $300.52, with indebtedness of $2,444.28

MOUNT CORY.—This company's indebtedness March 1st is reported to have been $13,924.67.

HUMBOLDT COUNTY.

GOLDEN JACKET.—The mines owned by this company will be developed the current year. The Cuba, one of the principal mines in the group, in 1862 had a reputation second to none in the State.

STOREY COUNTY—COMSTOCK LODE.

We condense the following from the Virginia City *Chronicle*:

The following is a summary of the ore and bullion output from mines in this county during the quarter ended December 31st, 1886, condensed from the assessor's abstract statement filed at the office of the county recorder:

Cons. California & Virginia—31,653 tons of ore of the average value of $25.45 per ton, produced $805,535.36 in bullion; total cost of production, $435,969.32, leaving a balance of $369,566.04 subject to taxation.

Savage—Total ore output, 160 tons; average assay value, $11.40 per ton; gross bullion yield, $1824.05; total cost of production, $1618.84.

Belcher—Ore output, 10,740 tons; assay value, $8.33; gross yield, $89,420.48; cost of production, $84,272.49.

Crown Point—Ore output, 10,386 tons; assay value, $9.81; gross yield, $101,433.78; cost of production, $96,339.59.

Kentuck—Ore output, 3238 tons; assay value, $12.70; gross bullion yield, $41,144.78; cost of production, $44,360.60.

Yellow Jacket—Ore output, 16,505 tons; assay value, $10.04; gross bullion yield, $165,724; cost of production, $220,807.25.

Giving a total ore output of 72,682 tons; bullion yield, $1,205,083.27; cost of production, $883,-368.09.

The financial balances of the various Comstock mining companies March 1st were as follows:

CASH ON HAND.

Alta	$16,534.45	Kentuck	1,927.41
Alpha	16,766.12	Lady Washington	280.61
Andes	18,168.07	Mexican	18,166.99
Best & Belcher	3,431.92	Ophir	31,587.43
Benton Con.	7,324.55	Occidental	317.97
Belcher	4,784 97	Overman	20,374.91
Bullion	22.241.45	Orleans	1,402.29
Challar	34,386.74	Potosi	3,377.77
Crown Point	24,231.18	Sierra Nevada	14.253.98
*Con. Cal. & Va.	314,553 24	Succor Con.	231.75
Challenge Con.	3,094.81	Scorpion	5,327.00
Exchequer	14,859.91	Utah Con.	5,257.76
Imperial	6,565.63	Union Con.	8,082.08
Julia	20.39		

* Cash in bank and unsold bullion on hand of the assay value of $195,320. The final shipment representing the clean-up for the month of February is yet to be added. The expense account for operating the mine during February, less the sum disbursed in salaries and wages to employés, and the amount of the dividend disbursed March 4, are not deducted from the balance on hand March 1. With these amounts deducted, including the discount on bullion, and the final shipment of $75,000, made on the February account March 7, there should be a balance of $325,000 remaining in the company's treasury.

INDEBTEDNESS.

The following companies report having an indebtedness March 1st, 1887:

Gould & Curry	$6,182.63
Hale & Norcross	38,108.23
†Savage	82,136.50
West Potosi	1,295.50

† Less $4,272.85 in unsold bullion on hand in the San Francisco office, and additional shipments yet to be received on the February account.

BEST & BELCHER.—On the 1500 level, the northeast drift is passing through porphyry, clay, and quartz showing value by assay.

BULLION.—The Cræsus shaft is reopened below the 200 level. The sides are showing mineralized quartz, which is evidently the top or cone of the ore development alleged to have been made on the 300 level in the early history of the mine.

CONSOLIDATED CALIFORNIA & VIRGINIA.—The official report for the week ended the 5th inst. shows that on the 1300 level west crosscut No. 1 from the north drift has cut into the west vein of the lode and shows some quartz which carries low assays. During the week, 962 tons of ore were shipped to the Morgan mill, 1616 tons to the Eureka mill. The average assay value of all the ore worked at both the above mills during the week, according to battery samples, was $34.12. This shows an increase of $7 per ton in the value of ore extracted last week above that of the preceding week. Bullion valued at $74,500 was on hand in the assay office.

CROWN POINT AND BELCHER.—The extraction of ore was resumed on the 9th inst.

HALE & NORCROSS.—At the annual meeting, the following directors were elected: H. M. Levy, Morris Hoeflich, William E. Sell, C. T. Bridge, A. C. Hamilton, W. C. Watson, and J. M. Coulter. H. M. Levy, President; W. E. Sell, Vice-President; Joel F. Lightner, Secretary; R. P. Keating, Superintendent; and Bank of Nevada, Treasurer.

The change in the directors indicates that the control of the mine has passed into the hands of Messrs. Hayward and Hobart. There was no contest, as the change was a result of a previous understanding between Hayward and Levy. The opening up of the 1200 and 1300 levels of the Chollar will now be proceeded with from both the Hale & Norcross shaft and Chollar incline.

IOWA.—The tunnel in the face is in vein matter giving low assays. The south drift from this tunnel is showing a stratum of gold-bearing quartz in the roof and face. The surface vein discovered recently has been cut across, showing a width of 12 feet and giving good assays in gold.

POTOSI.—Explorations above and below the 250 level are progressing quietly and have demonstrated the ore development to be far more important than the management anticipated it to be. The ore now exposed covers an area of several acres, ranging in assay value, it is stated, from $50 to $200 per ton.

SAVAGE.—The daily ore shipments from this mine to the Mexican mill have been increased to 100 tons, the grade of which, according to outside authority, exceeds $30 per ton. The north drift on the 1200 level is out 80 feet north of the Hale & Norcross line and has entered a belt of low-grade quartz.

SEGREGATED BELCHER.—This company has been organized with a capital stock of $5,000,000, shares $100 each. The directors are Maurice Schmidt, M. P. Hall, C. A. Schmitt, A. Herman and Thomas Cole. The mine was relocated last January by Dr. W. S. Bronson, and deeded by him to Maurice Schmidt for $50, as shown by a deed on file at the recorder's office. The ground is unpatented, and the present claimant alleges that the former owners neglected to perform the annual holding work for several years required by the United States laws to keep the title valid. The former company controlling the mine claim that many times the amount of labor required by the Federal statute has been performed annually below the surface through the Belcher mine. A suit to quiet title will probably be brought, unless a compromise is effected between the claimants. The Segregated Belcher was originally a portion of the Belcher mine. It contains only 160 feet, a little more than one-eighth of the original Belcher ground.

WASHOE COUNTY.

RENO SMELTING MILL AND REDUCTION-WORKS.—The marble that was brought from the Inyo County Cal., quarries for flux has been found to answer the purpose very satisfactorily. The company proposes to add to the plant this spring a refinery, and at least 10 or 20 stamps for the working of free ores.

NEW JERSEY.

MORRIS COUNTY.

DICKERSON.—This mine has been put in first-class working order, after a long period of idleness. Ore is being hoisted from the new shaft.

NEW MEXICO.

GRANT COUNTY.

BREMEN.—This company is endeavoring to make arrangements with the San Vicente Company to supply it with water from their storage tanks on the top of Legal Tender Hill. If the negotiations are successful, the Bremen mill will be removed to Chloride Flat, so that the necessity of hauling the ore a long distance will be obviated. This will result in a great saving to the company.

SAN VINCENTE.—The company has made a contract to buy the 4-11-44 mine at Bear Mountain.

NORTH CAROLINA.

RANDOLPH COUNTY.

NEW HOOVER GOLD MINING COMPANY.—The result of mining for February was 254 tons of ore crushed, producing 26 ounces of gold of the approximate value of $400.

ROWAN COUNTY.

GOLD HILL.—This company, which was recently reconstructed, is again in want of funds. The statement is that all the former capital was required to pay the debts and do the preliminary work, and that now £5,000 is required to explore the mine.

WILKES COUNTY.

FLINT KNOB.—This silver mine, which has been known for a number of years, though never worked to any extent, is just coming into notice again. The ore is an auriferous and argentiferous galenite. Parties have recently taken hold, and are engaged in opening the property with a view to determining the probable extent and value of the ore supply.

PENNSYLVANIA.

COAL.

The land suit of Dr. John T. Doyle against John Welles Hollenback, formerly of Wilkes-Barre, but now of Brooklyn, which has been in litigation for the past six years, terminated on the 14th inst., so far as

the courts of Luzerne County are concerned. It is a suit to gain possession of coal lands, now operated by the Delaware & Hudson Canal Company, valued at $70,000 or more. The case was referred to a referee, who decided in favor of Doyle. Mr. Hollenback appealed from the referee's decision, but Presiding Judge Charles E. Rice on the 14th inst. filed an opinion sustaining the referee's report. The case will be at once carried to the Supreme Court.

DERRY COAL AND COKE COMPANY.—This company has been organized, with a capital stock of $1,000,000, to carry on operations in Westmoreland County. The company will engage in the mining of coal and iron ore, and the manufacture, selling, and shipping of coke.

PHILADELPHIA & READING RAILROAD COMPANY.—The company will in the future carry all its coal by railroad and will abandon the use of the Schuylkill Canal.

NATURAL GAS.

BRIDGEWATER GAS COMPANY.—A meeting of the stockholders will be held on the 23d inst., to act upon the question of adding $400,000 to the capital stock of the company. The money is to be expended in extending the company's lines to New Cumberland, W. Va., East Liverpool, O., and other points in the pottery district. The proposed extension will add greatly to its revenues, since they have much more gas than is needed for their present system.

CANONSBURG LIGHT AND FUEL COMPANY.—The jury in the damage cases against this company returned a verdict on the 11th inst., giving damages to the different victims of the explosion, amounting in all to $6902.84.

CITIZENS GAS COMPANY.—The Town Council of Rochester has granted the privilege to this company to lay its pipes through this borough for the purpose of supplying gas for heating and illuminating purposes.

HOME NATURAL GAS COMPANY.—This company has ordered some nine miles of pipe, to be used in supplying Brownsville with gas from the big well, was struck near that place, as mentioned in our issue of February 19th. It is expected that the town will be piped within a month. The company has increased its capital stock from $10,000 to $100,000, and is drilling another well.

PENNSYLVANIA NATURAL GAS COMPANY.—This company will soon increase its capital from $1,000,000 to $2,000,000, and spend the money in extending and improving its supply system. The company is preparing to supply a heavier trade by drilling four new wells near Canonsburg on the Boise property and adjoining farms. It is officially denied that negotiations are in progress for the sale of the plant and franchise to the Philadelphia Company.

WESTMORELAND & CAMBRIA NATURAL GAS COMPANY.—At the annual meeting, it was decided to pay 10 per cent per annum on the capital of $2,000,000 in quarterly installments, to be declared on the 1st and payable on the 10th of January, April, July, and October. The report presented shows that the company is out of debt, has good gas territory, well laid lines, and a large and steadily increasing patronage, while its running expenses are very light.

OIL.

Exports of refined, crude, and naphtha from the following ports, from January 1st to March 12th:

	1887. Gallons.	1886. Gallons.
From Boston	1,044,520	587,700
Philadelphia	21,826,103	20,716,948
Baltimore	1,595,139	2,282,223
Perth Amboy	2,925,500	718,086
New York	65,365,273	73,316,073
Total exports	92,756,535	97,631,030

OIL RUN PETROLEUM COMPANY.—The charter of this company having expired, the assets will be distributed pro rata among the stockholders on surrender of their certificates at 217 South Third street, Philadelphia.

TENNESSEE.

LINCOLN COUNTY.

A company is being organized for the development of extensive marble beds in the vicinity of Kelso, on the Nashville & Chattanooga Railroad. They have purchased a large amount of land, and have options on nearly all the marble lands in that section. A $1000 order from the city of Nashville has already been received on the strength of samples sent.

UTAH.

JUAB COUNTY.

EUREKA HILL VS. BULLION-BECK.—In the two suits recently brought by the Eureka Hill to restrain the Bullion-Beck from selling, dividing the proceeds among the stockholders, and dissolving the corporation, also for the recovery of money for ores alleged to have been taken from Eureka ground, to which we referred in our issue of the 5th inst. Arthur Brown, attorney for the defendants, has moved for a change of venue to the Provo Court, that being the district where the mines are located. He has also demurred to the complaint for the reasons, first, that the facts stated do not constitute a cause of action; second, that there is a misjoinder of defendants in this: That no reason is shown for the joinder of L. John Nuttall, John Q. Cannon, W. W. Taylor, John Beck, and George Reynolds, with the other defendants; third, that there is a misjoinder of defendants in this: No reason is shown for joining the defendant, Hiram B. Clawson, with the other defendants in this cause.

WASHINGTON COUNTY.

BAILEY, NESBIT & CO. LEACHING-WORKS.—Messrs. Wyman & Harrison have purchased these works, to which we referred in our issue of the 5th inst., and will shortly begin operations. The assignment of unincumbered property to J. N. Louder, for the benefit of the employés, will probably realize but a small percentage of the sum necessary to offset the claims of preferred creditors; and the others will, no doubt, have to be content with whatever may be paid by the old firm.

STORMONT.—We have received the following official information: In the sixth south cross-cut, we have reached the hanging-wall of the vein, 48 feet from the level, which is near the foot-wall, and find from six inches to a foot of good ore against it. This is important, showing: *First*, that our work at this point is properly located, being all in the vein, as it should be; *second*, that our vein is regular, and carries *some* ore at this depth, even though the quantity is small; *third*, that the great Last Chance ore-body, to which this undoubtedly belongs, and which furnished us so much good ore from back of fourth and fifth levels last year, is not entirely exhausted, at any rate. On the sixth south, where ore was reported last week, we have squared up the cross-cut and raised up into the hanging-wall rock a short distance, to make sure of leaving nothing overhead, and started to drift south on the ore. Six feet progress has been made in this drift, and the ore shows no change, continuing to be from six to twelve inches thick.

VIRGINIA.

ROANOKE COUNTY.

ROANOKE ZINC AND SILVER MINING COMPANY.—Active development work is to begin shortly by the parties who recently purchased this property.

STAFFORD COUNTY.

RAPPAHANNOCK.—Official advices to us state that during February the mine produced over $2200, at a cost of about $900. Arrangements are being made to sink 100 feet deeper on the vein, and cross-cut then to the west vein, 300 feet distant from the main or central vein.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, March 18th.

Statistics.

Production of Coke on line of Pennsylvania RR. for week ended March 12th, and year from January 1st: Tons of 2000 pounds.

	1887. Week.	1887. Year.	1886. Week.	1886. Year.
Tyrone & Clearfield	...	1,700	.....	.....
Allegnany Region.	5,669	49,710	3,507	37,109
West Penn. RR....	2,500	22,267	1,257	17,784
Southwest Penn. RR	71,874	658.460	41,556	325.107
Penn. & W. Region	7,080	73.514	7,420	67,982
Monongahela	3,258	34,203	3,258	13,048
Pittsburg Region..	.....	...	.....	.....
Snow-Shoe..... .	1,178	10,182	764	8,118
Total.....	91,559	850,036	57,762	459,148

Production Anthracite Coal for week ended March 12th, and year from January 1st:

TONS OF 2240 LBS.	1887. Week.	1887. Year.	1886. Week.	1886. Year.
P. & Read. RR. Co..	164.614	1,433,488	208.575	1,827,198
Cent. R. R. of N. J.	103,782	774.957	*	*
L. V. RR. Co.....	144,234	1,259,806	128,975	1,269,925
D., L. & W. RR. Co.	108,286	992,187	100,492	1,088,888
D. & H. Canal Co..	65,968	917,620	99,388	902,344
Penna. RR.....	50,012	503.570	71.681	578.798
Penna. Coal Co.....	30,271	220,319	24,806	213,716
Total.....	667,167	6,101,947	633,917	5,880,869
Increase..... ..	33,250	221,078	....	.....
Decrease	... .	....	....	.....

* Included in tonnage of Philadelphia and Reading R. R.
The above table does not include the amount of coal consumed and sold at the mines, which is about six per cent of the whole production.

Production for corresponding period:

1882.....	4,492,037	1884.....	4,541.721
1883.....	4,915,233	1885.....	4,558,308

Production Bituminous Coal for week ended March 12th, and year from January 1st:
Tons of 2000 pounds, unless otherwise designated.

EASTERN AND NORTHERN SHIPMENTS.

	1887. Week.	1887. Year.	1886. Week.	1886. Year.
Phila. & Erie RR...	.....	.....	17	383
*Cumberland, Md..	61,367	532,285	20,424	368,300
*Barclay, Pa.....	3,724	51,415	3,759	42,172
*Broad Top, Pa.				
H. & Broad Top RR.	8,449	85,238	5,788	59,787
East Broad Top....	.....	.....	.....	.....
Clearfield Region, Pa.				
Snow Shoe.....	4,006	36,364	3,949	30 926
Karthaus (Keating)	3,003	39,401	4,711	25,137
Tyrone & Clearfield	55,783	577,802	40,876	535,835
Alleghany Region, Pa.				
Gallitzin & Mountain....	15,199	182,602	10,311	127,082
Pocahontas Flat Top Coal.				
Norf'k & West. RR.	†24,035	228,235	13,511	140,760
Kanawha Region. W. Va.				
Ches. & Ohio RR..	†30,000	293,305	†25,000	240,294
Total..... 205,566		2,026,647	128,346	1,570,676

* Tons of 2240 lbs. † Estimated.

WESTERN SHIPMENTS.

Pittsburg Region, Pa.				
West Penn RR.....	7,578	66,173	5,561	47.376
SouthwestPenn.RR.	3,082	32,294	3,121	22,363
Pennsylvania RR...	4,116	47,312	3,007	42.513
Westmoreland Region, Pa.				
Pennsylvania RR...	32,354	296,059	11,335	272,670
Monongahela Region, Pa.				
Pennsylvania RR...	5,895	70,450	4,541	34,328
Total.....	52,975	512,388	27,565	419,250
Grand total.....	258,541	2,538,935	155,911	1,989,926

Anthracite.

The statement is frequently heard in the trade that stove coal is "easy." In some quarters, the same remark is made in reference to one or two other sizes; but upon the whole, we can not see that the trade has become any worse during the past two weeks, while, in fact, it appears to be in excellent condition, with every indication of continuing so for a liberal time to come. Owing to the large consumption of anthracite coal, in the manufacture of iron and by general manufacturing industries, it is generally believed that the requirements of the market this year will be quite 34,000,000 tons. At times, the demand will probably be so slack that coal must accumulate; but it is a serious question as to whether the transportation facilities will not control the situation, and as to whether the companies will be able to actually get to market more than the amount named. Under these conditions, we think that it will be the greatest of folly to slaughter the entire product, as was done last year. If a few of the producers, who have either an inferior quality or inefficient facilities for selling coal, feel that they must make concessions in prices to dispose of their product, there is no reason why the other producers should reduce prices. If they do not, it will be but a very short time until those who sacrifice their coal will sell all they can produce, when buyers will discover that they must pay full prices. If a large proportion of the producers hold firmly to prices throughout the entire year, they can lose but very little business, and for any loss of trade they will be well compensated by the profits upon the business which they do succeed in getting.

During the week, the Pennsylvania Coal Company announced its Newburg prices. They are very satisfactory to the other companies.

They are as follows:

Lump.....	$3 60	Chestnut.....	$4.05
Grate.....	3.50	Pea	2.95
Egg.....	3.60	Buckwheat.	2.20
Stove	4.05		

The freight alongside this city and Brooklyn, 35 cents a ton. These prices differ but little from those asked by the other companies alongside here.

The Lehigh & Wilkes-Barre Coal Company's coal handlers at Port Johnston have finally surrendered unconditionally after a very sad experience. The company handled more coal in March, 1886, than during any corresponding month in the history of the company. The shipments so far this month are 5000 tons ahead of those to the corresponding time in this month last year.

Buyers are holding off for spring prices. This makes the trade appear to be very dull. Nevertheless the large companies seem to be very much pressed to meet the orders already on their books. The delay in making purchases now, is only producing an accumulation of requirements which will have to be met later, and it is thought that stocks are so low that the supplying of every day necessities will soon have to be esumed. Naturally, lower prices are looked for about

April 1st, but there are really no indications that such will exist throughout the market. The coal combination has expired, and there will not be a successor to it. Still we think that the companies will work in sufficient harmony to accomplish all that could be expected of a combination. In the past, the companies have been successful in taking advantage of each other under their coal combination; but now that they have better game in getting ahead of legislative bodies and Attorney-Generals, we do not see why they should not succeed equally well. Experience has taught that lower prices in the spring and summer, as compared with those asked during the active demand of the fall and early winter months, produce a more regular distribution of coal, and it may be found advisable to quote slightly lower prices about May 1st, although we have no positive reasons for thinking that even that will be done.

There is much uncertainty as to tolls under the Inter-State Commerce Law. On Wednesday, a meeting was held in the city at which it was thought advisable to fix upon $1.65 per ton for coal from the Lehigh District, and $1.85 from the Wyoming. It will readily be seen that if these rates should be adopted that there is but little show for a reduction in the prices of coal. It is believed that lower rates can be made for pea and dust, but this is likely to become one of the questions for the commissioners to decide. Under this law, the price of coal will have to conform to the tolls instead of basing tolls on the fluctuations of the price of coal. We think that the new conditions will work much to the advantage of the carrying companies.

We quote ordinary free burning coal, net f.o.b., as follows:

Lump	$3 40@
Steamboat	3.40@
Broken	3.40@
Egg	3.50@ 3.65
Stove	3.90@ 4.00
Chestnut	4.00@
Pea	2.85@ 3.00
Buckwheat	2.00@ 2 50
Dust	1.40@ 1 50

Bituminous.

There is practically nothing new to relate in reference to the trade in bituminous coal. The railroad companies have not named tolls, and as a consequence the coal companies have not been able to make prices. Contractors are beginning to show some anxiety in reference to their supplies for the coming twelve months. Spot coal is very scarce. Ordinary coal will readily fetch $3.25 f.o.b., while the best coals can be sold at $3.75@$4 per ton alongside. It is thought that prices will be named within a week.

Buffalo. March 17.

[From our Special Correspondent.]

Nothing new in coal circles. Shippers and dealers talking over the Inter-State Commerce Bill as usual. The result of the working of said bill, as anticipated by the wise men, will be fraught with much interest to the coal trade. But time will reveal all; speculations will become certainties.

Prices of coal and coke unchanged. Business confined to immediate requirements. Stocks of all kinds of coal light.

"It is too early to prognosticate, as there are so many new points to be discussed," says a friend at my elbow, "relative to the price of coal for the opening of the spring season; therefore the less you say on the subject the better." This is a sample of the opinions of our dealers and shippers at this port.

The Ancient Mariner of our Merchants' Exchange, bearing the well-known name of "Tom Collins," says "that the ice in the lake does not extend from Buffalo above 10 miles, and that the opening of navigation will be quite early this year." There is but little ice on Lake Erie, and it is said that boats expect to leave Cleveland for Detroit the beginning of next week. News from Toledo states that propellers would have but little, if any, difficulty in reaching that port.

No definite news has been received from the Sault and the Straits of Mackinaw; the weather there has been very severe and cold all the winter, and doubtless the ice is quite heavy and well packed. This subject will be matter for discussion on the docks for some time, as from past experience, say from 10 years, the time for the opening of navigation at the points named has varied from March 15th to May 3d.

According to present arrangements, the Welland Canal (Canada) will not be opened until May 3d for vessels drawing 12 feet of water, and on May 15th a draft of 16 feet will be available.

There are many complainers already of this contemplated late resumption of navigation, and the authorities are being petitioned to, so that the matter may be reconsidered. The extensive and important improvements of this water-way are being permanently completed, hence the delay.

On Tuesday last, in our State Assembly, Daly's bill appropriating $550,000 to lengthen one tier of eight locks on the Erie Canal at East Syracuse, one tier of seven locks at West Syracuse, and two locks on the Oswego canal was ordered to a third reading.

Buffalo. March 10.

[From an Occasional Correspondent.]

The coal trade has jogged along very comfortably since my last. It has been a good coal winter, and on the whole the coal men are pretty well satisfied. The wretched mistakes made in the opening months of last season have inflicted their own punisment, although us righteous fellows have suffered with the wicked. As the critical period of 1887 approaches, we begin to wonder if any amount of experience will teach wisdom to the corporation officials who control the destinies of the anthracite coal trade in the West, or whether the usual premium is to be offered to the man who can market his coal in the most absurd fashion and for the least money.

With bare markets and a large demand sure, a grand opportunity is now offered for placing the coal trade in the West on a business-like basis. Don't agree to any cast-iron scale of prices, but, instead of the hundred and one tricks and devices in the way of rebates, commission deals, salaries, etc., take enough off in price to offset. Don't keep up the practice of meeting monthly to agree to propositions which no one intends to keep.

Heretofore, the control of the market has been placed entirely in the hands of the retail dealers. At Buffalo, the companies contract to supply the retailers from the company yards by the single ton at much below the lowest wholesale circular; so that instead of there being any inducement for a dealer to purchase a quantity of coal, take it in, and pay for it, it is practically prohibited, and evidently regarded by the principal magnate of the Western coal trade as rascally, as he publicly thanked God that the last yard in Buffalo where the wicked practice had been followed had been compelled to close. The same system is being adopted in Rochester. At Milwaukee, a few years ago, there was a very respectable number of dealers who came East every spring and purchased from ten to fifty thousand tons each, and commenced to take it in at once, and from that on were pillars of strength in protecting the markets, because their interests all lay in advancing it. Now these same people are stocked up on commission, and their only interest is a large tonnage. At Chicago, the process began earlier and has been slower, but none the less thorough. In 1886, we all proceeded to contract with every dealer at every crossroads between Buffalo and the Missouri River for all the coal he wanted during the season at from 25 to 50 cents per ton below the lowest circular prices! That any coal was sold above these figures was owing to carelessness of buyers in letting their opportunity pass. You will see in all this that there is no inducement for capital to assist in the distribution of coal, and that, on the contrary, its use is prohibited.

These facts are notorious. Not one member of the Western committee will deny them or dispute the fact that the present method of distribution is vicious. Possibly, in view of Mr. ——'s thankfulness, I should except him, but I won't, for I think he agrees with me.

There is but one remedy for this condition of affairs—all the patent plans, resolutions, and agreements based on continuing these absurdities are but the nostrums of quacks. The companies must adopt the plan of selling their coal outright. They are all strong enough to pile up their coal at Buffalo or East until buyers realize they mean business. The present evils will continue until some one of the companies has sufficient backbone to adopt this policy and concede enough in price to offset these illegitimate allowances. There might be a struggle, but not a severe one, as really everybody desires the change, and in the end Mr. —— would have a better reason for thanking God than the closing of the last individual coal yard in Buffalo.

There is still another reason why this change should come about—the aim of the existing system is to drive all but the corporations out of the business. Take care, that is dangerous ground. The tendency of the age and the temper of the people are against the concentration of business and power in the hands of corporate monopoly. The people made these corporations and they can and will unmake them. Judge Asa Packer once said to the writer he sometimes wondered why the people did not declare the charters and property of several of the large coal-carrying roads forfeited to the State.

It does not palliate the offense of the war of corporation upon individuals to answer that coal is cheaper, or transportation cheaper, or oil cheaper. We might, by concentrating all business in the hands of one great corporation, reduce the price of every thing to a very small fraction of the present value, and all the world, except the members of the great corporation, might exist on the bare necessaries of life.

With over thirty millions of tons to divide, there is neither rhyme nor reason in engaging in any attempt to cut the throats of competitors. With the advent of the Inter-State Commerce bill let the coal-carrying roads and coal corporations adopt a more liberal spirit.

"OCCASIONAL."

Boston. March 16.

[From our Special Correspondent.]

There is only a very moderate trade in anthracite coal to report. The season of the year is now close upon us in which retail buyers only endeavor to keep stocks along, and do not, as a rule, buy ahead. F.o.b. prices are without material change, but there is an easier tone to the market. Hard white ash Stove has been offered as low as $3.85 f.o.b. at New York, while good free-burning as mined by outsiders can be had at $3.95 @$4, if not as low as $3.90. Company coal is nominally steady at $4.15. There is a steadier feeling in Egg coal at $3.70@$3.80, but Broken is in lighter supply and is firmer at $3.55@$3.65. The smaller sizes of anthracite steam coal have only a nominal quotation, say $4 for Nut, $3 for Pea, and $2 for Buckwheat, as they are in light supply, and some grades are practically out of the market for any thing like prompt shipment. The general impression is that the companies will endeavor to make present quotations the opening figures for next season, and will make no reduction.

The postponement of the date from the 10th to the 20th for the announcement of new prices for bituminous coal is variously received. Some do not hesitate to say that it indicates the instability of the pool, and its probable early disruption. On the other hand, it is claimed that the move is a wise one on the part of the producers, because the delay reduces stocks in hands of consumers, and will cut down the period of hanging back on their part, when prices do come out, just so much. At all events, shipments and orders are now restricted to small proportions, as all coal sold must be delivered before the 20th, or at least shipped before that date. Jobbers are now asking $2.40@$2.50 f.o.b., and we hear of $2.30 no longer.

Rates of freight have declined to the minimum rates of the Vessel Owners' Association.

We quote, exclusive of discharging: New York, 85 @95c.; Philadelphia, $1.05; Baltimore, $1.25@ $1.35; Newport News and Norfolk, $1.05@$1.10.

There is but little movement at retail and prices are not well sustained, quoting as follows: White Ash Stove, $6.50; Egg, $6.25; Broken, $6; Franklin, $8 —all above are delivered prices.

Cleveland.

A dispatch states that a secret meeting of the coal producers of the Hocking Valley, the producers of the Pittsburg region, and the coal shippers of Northern Ohio was held at Cleveland on the 17th inst., for the purpose of adjusting differences which they claim have been detrimental to all concerned. It was agreed on all sides that the prices should be such that the producers will make at least ten cents a ton and the shippers ten or fifteen cents. They could come to no agreement and another meeting will be held to-morrow morning.

Pittsburg. March 17.

[From our Special Correspondent.]

The coal market during the week has shown no particular change. At this writing, the water in the Ohio is not sufficient for exporting coal. The March shipments to date are: for Cincinnati, 3,070,000 bushels; for Louisville, 5,050,000 bushels; total, 8,264,000. Prices in Cincinnati during the week declined ½ cent per bushel. There is reasonable authority for stating that the Monongahela and Kanawha coal men will pool their coal so as to obtain a living price.

The following are the prices of coal afloat at the mines, based on the new rates of mining: 1st pool, per 100 bushels, $4.50; 2d pool $4.25 per 100 bushels;

3d pool, $3.62½; and 4th pool, $3. Railroad, $4.50 @$5.

CONNELLSVILLE COKE.—The current rates are as follows: Blast Furnaces, $2.00 f.o.b. cars at ovens; Foundry, $2.30; Crushed, $2.60.

Freights westward are as follows: From the ovens to Pittsburg, 88 cents a ton; to the Mahoning and Shenango valleys and Wheeling, $1.65; and to Chicago, $3.30.

FREIGHTS.

The latest actual charters to March 18th, per ton of 2240 pounds:

To	From Philadelphia	From Baltimore.	From New York shipping ports.
Baltimore	.60§	....	.....
Bath, Me	1.25*	1.25	85*
Boston, Mass	1.00@1.25*	1.25	85*
Bridgeport, Conn	.....	1.15	.....
Bristol	.....	1.25	.....
Brooklyn	.....	1.10	.....
Cambridge, Mass	1.05*	.....	85* 3c.
Cambridgeport	1.25*	.....	85* 3c.
Charleston, S. C	90@1.10	1.25	.....
Charlestown	1.05*	1.50	85*
Chelsea	1.05*	.....	85*
Com. Pt., Mass	1.05*	.....	85*
E. Boston	1.25*	.....	85*
East Cambridge	1.25*	.....	.....
E. Gr'nwich, R. I	.....	.....	80
Fall River	.....	1.15	75@80
Galveston	.....	3.00	.....
Georgetown, D.C	1.10	.....	.....
Gloucester	1.10*	.....	.....
New Bedford	1.00	1.15	85@90
Newburyport	.....	.....	1.00*
New Haven	.....	1.15	.70
New London	.....	1.15	.75
New York	.90§	1.10	.....
Norfolk, Va	.90	.....	.....
Norwich	.....	.....	.75@80
Norwalk, Conn	.....	.....	.75
Portland, Me	1.25*	1.25	1.50*
Portsmouth, N.H	.....	1.35	.95*
Providence, R. I	1.00@1.05*	1.15	75@80
Quincyport	.....	1.25	.....
Richmond, Va	.70	.....	.....
Roxbury, Mass	1.05@1.25*	.....	.....
Salem, Mass	1.05@1.25*	1.25	.85*
Savannah	1.00	1.00	.....
Somerset	.....	1.15	.....
Washington	1.10	.....	.....
Williamsb'g, N.Y	.....	1.10	.....
Wilmington, N.C	.....	1.00	.....

* And discharging. † And discharging and towing. 3c. per bridge extra. § Alongside. ‖ And towing up and down. ¶ And towing. †† Pilotage. ** Below bridge. *** Old B. L.

MARKETS.

NEW YORK, Friday Evening, March 18th.

Prices of Silver per ounce troy.

Mar	Sterling exchange	Lond'n Pence.	N. Y Cents	Mar	Sterling exchange	Lond'n Pence.	N. Y. Cents
12	4.86¼	45¾	99¼	16	4.86¼	45⅛	98¾
14	4.86¼	45¾	99¼	17	4.86½	45⅛	98½
15	4.86⅛	45⅝	99	18	4.86½	45¼	98¼

The Metal Exchange.

The annual report of the Secretary of the Metal Exchange shows a decrease in outstanding rights of membership from 352 to 336, sixteen seats having been bought in by the Exchange. Nearly 200 memberships are said to be held by persons in the metal trades. Information and statistics continue as full as ever. The Exchange is very well equipped in this department.

A review of the business done since March 1st, 1886, shows that the iron business has utterly disappeared from the Exchange, although it is the opinion of the Secretary that this is the only basis for business which a Metal Exchange can ever have.

The present membership is almost exclusively a "tin and copper circle," and it is claimed that the tin business of New York is practically done openly on the Metal Exchange; the iron men will not do business on the Exchange; hence, the only recourse in order to uild up an Exchange business in iron seems to be the Speculative Public. The Secretary suggests moving the site of the Exchange to a locality nearer the centers of speculation.

The Exchange yesterday voted in favor of reducing the annual dues from $35 to $30. The Board of Managers has not yet taken action on this.

Foreign Bank Statements.—The governors of the Bank of England, at their weekly meeting, made no change in the minimum rate of discount and it remains 3½ per cent. During the week, the bank gained £439,000 bullion, and the proportion of its reserve to its liabilities was raised from 48·80 to 48·84 per cent, against 41⅞ per cent at the same time last year. On the 17th inst., the bank gained on balance £156,000 bullion. The weekly statement of the Bank of France shows a loss of 5,750,000 francs gold, and a gain of 2,125,000 francs silver.

Copper.—The history of the market this week is largely a repitition of last week; it has been firm and dull. Sales of Lake Copper are reported ranging from 10·60 to 10·75 cents. To-day 10·50 is bid and 10·65 cents asked in second hands.

Sales of Baltimore and Orford are reported at 9·65 and 9·70 cents. It is rumored that one brand sold down to 9·35 cents. Dealers are still hammering the market with little apparent effect on producers, offering Lake down to 10·45 cents in small lots.

Chili Bars opened to-day at £39 7s. 6d., and closed at £39 10s., an advance of 2s. 6d. Total sales, 200 tons.

We hear of a sale of 400 tons parrot slabs for export, also a sale by the Pennsylvania Lead Company of 150 tons argentiferous copper matte, prices not stated.

The reported sale last week of 8000 tons Anaconda, fails to materialize as yet; 150 tons Anaconda Matte have been sold for April delivery, destined for England, at an f.o.b. price in New York on Ledoux & Co.'s assay.

EXPORTS OF COPPER THIS WEEK.

To Havre—*45 casks copper, 57,600 lbs.; $6000.

To Hamburg—†Copper bullion: 10 bars, 634 lbs.; $1200. ‡Copper ore: 197 sacks, 30,876 lbs.; $8736.

To Rotterdam—*45 casks copper, 57,600 lbs.; $6000.

* Lake copper. † Jeweler's bars. ‡ Copper ore brought from Galveston.

Tin.—Cables to-day to the Metal Exchange quote Spot Straits at £102; three months, £102 12s. 6d., with a firm market. The Exchange quotes 22·60c. for Spot Straits or Malacca, up to 22·75c. for June delivery, though it is doubtful whether actual consumers could buy for immediate use under 22·75c. Apart from a speculative view of tin, it is reported that stocks are low, and consumption is already ahead of production.

Lead.—The price has drifted slowly down during the week. Sales have reached about 600 tons, being at 4⅝c. and later at 4·35c., at which considerable was offered without takers, and finally it dropped to 4·30c., at which one lot was sold. The gradual decline has demoralized buyers and they look for a 4·25c. market next week, but heavy arrivals here have depressed the New York quotation below the parity of Western prices and a reaction here seems more probable than does a general decline at all other points. We quote the market at the close 4·25c. bid, and 4·30c. to 4·35c. asked, according to brand, quantity, and time of delivery. Futures are in light demand, but sellers do not care to name prices.

Messrs. Everett & Post, of Chicago, telegraph as follows to day: The market remains about the same—if anything, a shade weaker, owing to light sales in New York. Demand is only moderate, and but very little doing. Offerings are only moderate. Sales: 300 tons at 4·25 to 4·27½c., closing at 4·25c.

Messrs. John Wahl & Co., of St. Louis, telegraph as follows to-day:

Among sellers of Common Lead there has been a weak feeling all around, carrying down the prices to 4·15@4·17½c. Our buyers here are very bearish and do not want at current quotations, and are apparently joining the mournful procession of their Eastern comrades. Sellers of Desilverized and Refined are stiffer, and do not feel like quoting below 4·20@4·22½c.

Spelter.—The London market by cable advices to-day quotes £14 5s. for Silesian. We quote 4·45@4·80c., according to brand, and 6½@7c. for New Jersey.

New Jersey Zinc Oxide, 4@4½c., according to grade.

Antimony.—Cables to the Metal Exchange to-day quote Hallett's at £30. The market here remains at 7⅝c. for Hallett's and 9c. for Cookson's.

Quicksilver.—There is no change to report. We quote $42 per flask, and 52½c.@53c. per pound; in London, £7 per flask.

Nickel.—We quote 65@67½c. per pound.

Aluminium—Is quoted at 90c.@$1 an ounce

IRON MARKET REVIEW.

NEW YORK, Friday Evening, March 18.

American Pig.—This market continues firm and quiet. It is hard to buy small lots. The furnaces are busy filling orders. We quote for Standard Lehigh and North River brands, as before, $21@$22 for No. 1 X,; and $20.50@$21 for No. 2 X. Forge unchanged, $18.50@$19. Little or no Southern iron is now offered in this market.

Scotch Pig.—The market is dull and weak. Coltness, Dalmellington, Clyde, and Summerlee constitute the bulk of the importations, with a little Glengarnock and Langloan. We quote: Coltness, $22.50@$22.75; Dalmellington and Clyde, $20.50@$21; Summerlee and Langloan, $22.

Cables to-day to the Metal Exchange quote: Coltness, 56s. 3d.; Langloan, 53s.; Summerlee, 55s.; Gartsherrie, 50s. 3d.; Eglinton, 45s.; Glengarnock, 49s.; Dalmellington, 47s.

Bessemer Pig.—The market is very dull, with Foreign quoted $20.75@$21, and no business in Domestic.

Spiegeleisen.—There is almost no business, with Foreign 20 per cent. still quoted $27.50@$28.

Steel Blooms and Billets.—There is nothing worthy of note in the market. Prices continue at from $30@$30.50 for Rail Blooms. Billets, $32@$33, according to size and quality. Nail Slabs, $32@$32.50. American Charcoal Blooms, from $54@$56. Scrap Blooms, $36@$37.

Steel Rails.—The mills are all sold ahead and are busy with deliveries. We continue to quote $39@$40 at Eastern mills. There are inquiries on the market for several lots ranging from 30,000 tons downwards. Small lots are hard to place under $40. English rails are still quoted $42@$43 at New Orleans. It is stated on reliable authority that over 70,000 tons of English rails are now being forwarded to New Orleans and San Francisco on recent orders.

Structural Iron and Steel.—Deliveries continue active. We quote: Bridge Plate, 2·4@2·5c.; Angles, 2·3@2·4c.; Tees, 2·7@2·8c.; Steel Angles, 2·5@2·6c., all from mill. Beams and Channels, 3·3c., base from dock.

Steel Plates.—We quote: Tank, 2·85@3c.; Boiler and Ship Plates, 3@3¼c.; Flanges, 3½@3¾c.; Extra Flange and Fire-Box Plate, 4½@4¾c.

Merchant Steel.—There is no change to note for quantities. We quote: American Tool Steel, 7½@10c.; special qualities, 11@20c.; Crucible Machinery, 4@4·5c.; Bessemer and Open-Hearth Machinery and Spring, 2·7@3c.; Sleigh Shoe, 2·4c.; Open-Hearth and Bessemer Cutlery, 3·2c.

Plate Iron.—There is a large Western demand. We quote as before: Common Tank, 2·45@2·55c.; Refined, 2·50@2·60c.; Flange Iron, 3·7@3¾c.; Extra Flange, 4·25@4½c.

Bar Iron.—We quote: Refined, 2·25@2·50c., from store; Common, 2@2·10c.

Cast-Iron Pipe.—Quotations remain at $30 for 36-inch, up to $37 per ton for 4-inch.

Rail Fastenings.—We quote: Spikes, 2·60@2·75c. per pound, delivered, and 2·60c. at mill. Angle Fish-Bars; 2¼c., Bolts and Nuts, 3·2c. for square, and 3·4c. for hexagonal.

Scrap.—The market is very quiet, with both buyers and sellers holding off, though there are some good inquiries. Choice Yard Scrap is held at $25, and some Foreign can be bought at about $23.

Old Rails.—Little activity is expected until definite action on the Inter-State bill and the adjustment of freights is taken. Tees are quoted $2250@$23., and Double-Heads $23.50@$24 ex ship.

Louisville. March 9.

[Reported by GEORGE H. HULL & CO.]

There is very little change to report in the market for pig-iron. Consumers are using up iron already bought very rapidly, and urging prompt shipment on old orders. We hear of very large purchases this week, and know of only a small quantity being offered by the regular furnaces. Many odd lots still remain on the market, but at firm prices. We quote for cash as below:

PIG-IRON.

Southern Coke, No. 1 Foundry	$21.50@$22.00
" " No. 2 "	20.50@ 21.00
" " No. 2½ "	20.00@ 20.50
Hanging Rock Coke, No. 1 Foundry	21.00@ 21.50
Southern Charcoal, No. 1 Foundry	22.00@ 23 00
Silver Gray, different grades	20.00@ 20.50
Southern Coke, No. 1 Mill, Neutral	19.50@ 20.00
" " No. 2 " "	19.50@ 20.00
" " No. 1 Mill, Cold Short	19.00@ 19.50
" Charcoal, No. 1 Mill	20.50@ 21.00
White and Mottled, different grades	17.50@ 18.50
Southern Car-Wheel, Standard Brands	26.00@ 27.00
" " Other "	24.00@ 25.00
Hanging Rock, Cold-Blast	27.00@ 28.00
" " Warm-Blast	23.00@ 24.00

Philadelphia. March 17.

[From our Special Correspondent.]

The market is quiet for almost all iron and steel materials. The reason is, that consumers have contracted for large supplies, and manufacturers are sold far ahead. There is nothing to do but use up what has been bought, and await further developments. Prices

are not exactly strong, but they are steady, especially when good material is wanted. The furnace companies all through the State are not seeking new business and would not accept it on any but their own terms. Founders are well supplied except in Eastern markets. Local consumption has been growing. Mill iron consumption has gone to very high figures, and except for, perhaps, seven or eight inferior brands, it can not be positively asserted that lower prices would be taken for large summer delivery orders. Makers are resolved to wait until they have iron to sell before selling it, and buyers want to know a little more about the summer business probabilities before loading up with iron. It is intimated by furnace agents that as soon as freight rates are fixed a great deal of business will be done in April. Very little Southern iron has been offered here. Muck bars are gaining some strength, and anthracite blooms are selling at outside prices. Anthracite coal is high, and labor has been advanced, hence no drop need be looked for in iron or steel. The inquiries for foreign material have been largely withdrawn, and American buyers will let the market alone.

The existing inactivity is due mainly to the fact that every body has all the iron wanted, and mills are not in need of new business. A strong consideration is that the next four weeks may let in an unexpectedly large demand for many kinds of material. There are, in fact, some evidences of this. Agents have knowledge of many iron and steel using enterprises which have not yet been supplied with iron. The merchant bar makers are doing a steady business throughout the State, and new rolls and other mill improvements are going on. The nail makers are slackening up all around, but will not reduce prices below $2.50, because of the increasing cost. Skelp iron is weaker. Pipe contracts are offered and will be booked at full figures. Rail blooms are quoted firm. Structural material is not called for, because all mills are overcrowded, and all near-by requirements are filled. Cast-pipe orders are dropping in every week and all manufacturers are busy. Steel rail quotations are firm and business is not solicited. The negotiations looking to foreign supplies have been terminated, and brokers are not able to promise better terms later in the season. Heavy ore arrivals are reported daily, and large iron and steel shipments are due in a few days. Very little business is done in old rails, iron, or steel, and foreign holders are disinclined to meet the views entertained by American buyers. Scrap is quiet and dull. Receipts will increase henceforth. The current quotations are given below :

	$	$
Foundry No. 1	21.50@22.50	
Foundry No. 2	19.50@20 00	
Gray Forge	18.50@19.50	
Bessemer Pig	20.50@21.50	
Foreign material :		
Steel Rail Bl'ms	30.00@31.00	
Foreign Bess'r	21.00@22.00	
Speigeleisen	27.50@28.00	
Scrap, Selected	24.50@.....	
No. 1	24 00@.....	
Cargo Scrap	23.50@.....	
Muck-Bars		35.00@.....
Merchant Iron		2@2.30c.
Plate Iron		2.50@.....
Tank Iron		2 45@.....
Skelp Iron		2.20@.....
Structural iron :		
Angles		2.25@.....
B'ms and Chan.		3 30@.....
Nails		2.50@.....
Steel Rails		39.50@41.00
Old Rails		23.50@25.00

Pittsburg. March 17.

[From our Special Correspondent.]

The market since our last has undergone scarcely any change. The sales were fully up to the previous week, and something over. For strictly No. 1 iron, prices were the same ; for odd lots and unknown brands, prices were somewhat shaded ; as a matter of fact, the daily transactions are fewer and smaller than they were a month ago, but this is no evidence of their condition, as consumers were ordering liberally during the first two months this year, to say nothing of the heavy business done during the last three months of 1886.

Several of the furnaces are busy on previous contracts. The very best evidence of this is the fact that large orders for standard brands can not be readily placed. Beyond all question, rates in both iron and steel departments are restless, and are likely to continue so until they settle on a stable basis, which will not be far from present rates, and there will stay until next fall. The general trade conditions at home are : Consumption continues to gain ground ; that spring indications are favorable ; prices have been steadily maintained, and that manufacturing interests are not manifesting any inclination to reduce prices, even were they able to make business. There is evidently a strong feeling, with the exception we have noted, and no causes are at work to lessen confidence in continued steady prices, except the one cause, expanding production. This cause will in time create a reaction in the future. A well-informed iron man says, substantially, "that while business has dropped off a little in some instances, there is no occasion for doubt. Demand must improve and prices can not weaken materially."

A noticeable feature here is that several of the large furnaces are not in the market to sell ; their faith can be judged by works. Upon inquiry, the answer is, we are not offering at present. A moderate concession would cause large sales. Muck Bar shows more firmness ; the same may be said of Old Rails.

	$	$
Coke or bituminous :		
Foundry No. 1	21.50@22.00	
Foundry No. 2	21.00@21.50	
Gray F., No. 3	20.00@20.50	
" " No. 4	19.50@19.75	
White	18.50@19.00	
Mottled	19.00@19.50	
Silvery	19.00@20.00	
Bessemer	22.50@23.00	
Charcoal :		
Foundry No. 1	24.00@25.00	
Foundry No. 2	23.00@24.00	
Cold-Blast	27.00@30.00	
Warm-Blast	24.00@25.00	
20 p. c. Spiegel	@31.00	
Muck-Bar		35.00@35.25
Steel Blooms		34.50@36.00
Steel Slabs		33.00@35.00
Steel Crop Ends		24.50@25.00
St'l Bl'm Ends		24.00@24.50
Old Iron Rails		27.00@27 50
Old Steel Rails		24.00@25.00
No. 1 W. Scrap		25.00@26.00
No. 2 W. Scrap		23.00@24.00
Steel Rails		41.00@41.50
" light sect's		40.00@45.00
Bar Iron		2.00@.....
Nails $2.60 net car lots.		
Steel Nails $2.60 net car lots.		

SALES SINCE LAST REPORT.

2000 Tons Bessemer	$23.00	cash.
1000 Tons Bessemer at Furnace	22.15	cash.
800 Tons Gray Forge, Lake Ore	20.60	cash.
200 Tons Gray Forge, all Lake Ore	20.00	cash.
200 Tons Gray Forge, Lake Ore, at Furnace	20 85	cash.
20 Tons No. 2 Foundry, Lake Ore	21.75	4 mo.
800 Tons Steel Billets, American	36.20	cash.
500 Tons " "	36.50	cash.
200 Tons " "	36.50	cash.
1500 Tons Nail Slabs, "	35.00	cash.
400 Tons Gray Forge, Anthracite	20.00	4 mo.
1000 Tons Muck Bars, April	35.75	cash.
850 Tons " March	35.50	cash.
250 Tons " Spot	35.25	cash.
1000 Tons Steel Wire Rods, American, April	45.50	cash.
550 Tons " " " March	45.25	cash.
150 Tons White and Mottled ; Native Ore	18.50	4 mo.
150 Tons Gray Forge, Native Ore	19.50	4 mo.
175 Tons Gray Forge, Native Ore, at Furnace	19.75	60 days.
200 Tons White Native Ore	18 50	4 mo.
500 Tons Old Rails, Ts, Imported	27.00	cash.
50 Tons Cold Blast, Charcoal	28.00	cash.

FINANCIAL.

Mining Stocks.

NEW YORK, Friday Evening, March 18.

The market in mining stocks continues to be active. Prices on the whole have been firm and show a great variation only in a few instances. Upon the New York Stock Exchange, mining stocks have been more quiet than for some time past, but still there is no decrease of interest displayed. It is stated that some new mines are to be put on the market soon by professionals, and the gamblers of the street are anxiously awaiting a chance to get in on "hard pan."

The decline in Consolidated California & Virginia has been the feature in this market, the price going from $20@$16.50. Savage advanced from $6.75@$7; Yellow Jacket remained at $5.75 ; Best & Belcher at $11.25, and Union Consolidated at $4.15 ; Hale & Norcross declined from $5.75@$5.25 ; Sutro Tunnel shows large sales at 21@23c.

The assessment levied by the Navajo Mining Company had a depressing effect on the stock, which declined from 95 to 77c.; the same may be said of North Belle Isle, which went from $4.90 to $4.50. Belle Isle was firm at from 51 to 55c.

Middle Bar has again been the centre of attraction among the California stocks, and show sales of 166,500 shares at from 75c. to $1. Amador advanced from $1.50 to $1.70. Elsewhere we publish information which is of interest to those who may feel inclined to invest in the stocks. We have official information that the prospects of Green Mountain are brightening. The stock was quiet, selling at from 39@40c. Plymouth remains firm at $17.13@$17.25. Quicksilver Preferred and Common sold respectively at from $31.63@$31.25 and $7. Stanislaus was active at from $3.25@$3.55. But a small business was done in the Bodies. Bodie Consolidated sold at from $2.85@$2.75. Bulwer, at from $1.20@$1.30. Standard, $1 ; and Mono at $2.50.

A small business was done in Ontario at $25.50; in Horn-Silver at $1.25, and in Stormont at 11@12c.

The frail "Security" Mining Company, of Colorado, which has been listed on the Consolidated Stock and Petroleum Exchange, after having been refused a quotation in Boston, is being "worked" up by the insiders with the hope of finding dupes to buy it at $6 to $7 a share, or say $7,000,000 for the property which those acquainted with it say would be dear at *one* cent on the dollar of this sum.

The company claims to have on the dumps 90,000 tons carrying 8-oz. silver per ton, 5000 tons 35-oz. ore, and 2000 tons 80-oz. ore, and 50 tons running from 400 to 1100-oz. silver per ton. And yet we learn from thoroughly reliable sources that about 150 tons of Security Company's concentrates (not mere ore or rich ore, but concentrates), ran 46 ounces silver and 56 per cent silica, while a few sacks of selected ore (probably some of the "50 tons 1100-oz. ore") from the new strike, contained 75 ounces per ton. And a lot of the company's "lead ore" carried 21 per cent lead and 13-oz. silver, besides being highly siliceous.

The whole scheme, as offered here, is what is familiarly known as "fraud;" and it is a shame to our stock boards that they should allow such things to be floated under their protection. The stock has been selling at from $6.50@$7.50, closing at $6.87 to-day.

Among the other Colorado stocks, Colorado Central shows sales at from $2.75@$3; Robinson, at 40c.; Little Chief, at 29c.; Silver Cliff, at 14c.; Lacrosse, at 15c.; American Flag, at 10c.; Leadville, at 69c.@70c.

Homestake remained firm at from $14@$15.75. Deadwood was quiet at $2.25. Father de Smet appeared again on the list at 75c., and Caledonia showed sales of over 1000 shares at $1.30.

El Cristo is still a favorite, and much higher prices are looked for by those who are carefully watching the manipulation. The stock during the past week was largely dealt in at prices ranging from $6 to $6.37.

The deal in Phœnix has collapsed. The stock has been very weak. The price on Saturday fell from $5.87 to $3, and since then has ranged from $3 to $3.75, closing at $3.50 to-day. There are indications that insiders are picking up all the stock that they can get at current prices. Should the report of Professor Ricketts prove satisfactary, it will undoubtedly be the basis for another deal by the manipulators.

A few sales of Silver King were made at $8. Central Arizona was quoted at 14c., and Silver Queen at 21@22c.

Rappahannock continues to attract attention at 15 and 17c. Elsewhere we give the official report for February.

New Germany was again active, with sales of shares at declining prices ranging from 63c. to 51c.

Holyoke shows large sales at 14@17c. Castle Creek was quiet at 11@15c.

The following securities were sold at auction in this city on the 16th inst : 200 shares Pennsylvania Coal Company, $269 to $270¼ ; $27,000 Gregory Consolidate Mining Company first mortgage bonds, 15 ; $2500 N. Y. and Lackawanna Coal and Iron Company first mortgage 6 per cent. bonds, $41 per lot.

Coal Stocks.

The market for stocks and bonds at the New York Stock Exchange during the past week has been pronounced, by unanimous consent, decidedly stupid. The business has become very small, and the fluctuations have been so limited as to entirely exclude trading. A large number of operators and prominent brokers are taking a rest. They have been flocking to Old Point Comfort, Florida, and Bermuda. There is a disinclination to either buy or sell stocks until after April 1st, and until the money situatson becomes better defined. There is, however, less fear of severe stringency now than there was a week ago. Brokers and others who would suffer by tight money, having been making time loans, for which they have had to pay as high as 6 per cent. Furthermore, there is an inclination to see whether the Baltimore & Ohio deal will go through and who will become the new owner. If it should go through in harmony with Mr. Gould and the Pennsylvania road, it is believed that it will be the foundation for a very big bull market.

Delaware, Lackawanna & Western and Morris & Essex were weak, owing to legislation in New Jersey looking to the annulment of the charter of the latter company, but a proposition to compromise resulted in a recovery of prices. The other coal stocks have been without any special features. Colorado Coal and Iron has been more active and strong.

Meetings.

The annual and special meetings of the following companies will be held at the times mentioned :

Alturas Consolidated Mining Company, office of Johnson, Gallup & Hurry, No. 58 William street, New York City, April 13th, three o'clock P.M. Special meeting for the purpose of considering and acting upon an agreement to be submitted to the stockholders to consolidate the Alturas Consolidated Mining

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par	Assessments. Total levied to date.	Assessments. Date and amount per share of last.			Dividends. Total paid to date.	Dividends. Date and amount per share of last.		
1	Adams, S. L.	Colo.	$1,500,000	150,000	$10	*				$555,000	Jan.	1887	.15
2	Alice, S. C.	Mont	10,000,000	400,000	25	*				750,000	Sept	1886	.06¼
3	Amie Con., S. L.	Colo.	5,000,000	500,000	10	*				330,000	Oct.	1883	.05
4	Amy & Silversmith, S.	Mon.		344,419						264,852	Dec.	1886	.10
5	Atlantic, C.	Mich	1,000,000	40,000	25	$280,000	Apl.	1875	$1.00	360,000	Jan.	1887	$1.00
6	Argenta, S	Nev..	10,000,000	100,000	100	295,000	July	1885	.10	40,000	Feb.	1880	.20
7	Aurora, L.	Mich	1,000,000	40,000	25					40,000	Apl.	1887	1.00
8	Barbee & Walker, S.	Utah	1,000,000	100,000	10	*				60,000	Nov	1880	.10
9	Bassick, G. S.	Colo.	10,000,000	100,000	100	*				400,000	Mar.	1884	1.00
10	Belle Isle, S.	Nev..	10,000,000	100,000	100	160,000	Feb	1887	.20	300,000	Dec.	1879	.25
11	Belcher, G. S.	Nev..	10,400,000	104,000	100	2,217,335	Dec.	1885	.30	15,397,000	Apl.	1876	1.00
12	Bellevue Idaho, S. L.	Idah.	1,250,000	125,000	10	26,250	Dec.	1883	10	200,000	Jan	1887	.10
13	Big B'nd Hydraulic, G	Dak..	1,000,000	200,000	5	*				228,000	Mar.	1887	.03
14	Black Bear, G.	Cal..	3,000,000	30,000	100	22,500	Dec.	1884	.25	895,000	May	1883	.20
15	Bodie Con., G. S.	Cal..	10,000,000	100,000	100	374,990	Jan.	1887	.50	1,602,572	Apl.	1885	.50
16	Bonanza Developm't	C & M	3,000,000	300,000	10					135,000	Oct.	1882	.15
17	Bonanza K'g, Cons. S.	Cal..	1,000,000	100,000	10	*				185,000	Feb.	1885	.10
18	Boston & Mont, G.	Mont	2,500,000	250,000	10	*				520,000	Jun	1886	.15
19	Breece, S.	Colo.	5,000,000	200,000	25	*				2,000	Feb.	1880	.01
20	Brooklyn Lead, L. S.	Utah	500,000	50,000	10					102,000	Sept	1886	.05
21	Bulwer, G.	Cal	1,000,000	100,000	100	40,000	Oct.	1885	.20	175,000	Jan.	1884	.10
22	Caledonia, G.	Dak.	10,000,000	100,000	100	505,000	May	1885	.15	40,000	Feb.	1886	.10
23	Calumet & Hecla, C.	Mich	2,500,000	100,000	25	1,200,000				28,850,000	Mar.	1887	5.00
24	Carbonate Hill, S. L.	Colo.	2,000,000	200,000	10	*				80,000	Apl.	1884	.05
25	Caribou Con., S.	Colo.	1,500,000	150,000	10	*				50,000	Mch	1880	.10
26	Castle Creek, G.	Idah.	100,000	100,000	1					51,000	Oct.	1883	.03
27	Catalpa, S. L.	Colo.	3,000,000	300,000	10	*				270,000	May.	1884	.10
28	Central, C.	Mich	500,000	20,000	25	100,000	Sept	1861	.06	1,820,000	Feb.	1887	2.00
29	Christy, S.	Utah	10,000,000	100,000	100					10,000	Jun.	1885	.10
30	Chrysolite, S. L.	Colo.	10,000,000	200,000	50	*				1,650,000	Dec.	1884	.25
31	Colorado Central, S. L.	Colo.	2,750,000	275,000	10	*				198,750	Apl.	1887	.05
32	Cons. Cal. & Va., G. S.	Nev..	21,600,000	216,000	100	108,000	Jan.	1885	.20	388,000	Mar	1887	.50
33	Con. Gold Mining, G.	Ga...	500,000	100,000	5	*				108,000	Nov.	1883	02
34	Contention, S.	Ariz.	12,500,000	250,000	50					‡2,587,000	Dec.	1884	.25
35	Crescent, S. L. G.	Utah	15,000,000	600,000	25	‡				210,000	Aug.	1886	.05
36	Crown Point, G. S.	Nev..	10,000,000	100,000	100	2,675,000	Feb.	1882	.25	11,588,000	Jan.	1875	2.00
37	Daly, S. L.	Utah		150,000						75,000	Feb.	1887	.50
38	Deadwood-Terra, G.	Dak..	5,000,000	200,000	25	*				‡900,000	Jan.	1883	.10
39	Derbec B. Grav., G. S.	Cal..	10,000,000	10,000	100	90,000	Dec.	1881	.10	140,000	Jun	1886	.10
40	Dunkin, S. L.	Colo.	5,000,000	200 000	25	*				220,000	Sept	1884	.05
41	Elkhorn, G. S.	Mont	1,000,000	100,000	10	50,000	July	1883	.50	165,000	Mar.	1887	.05
42	Eureka Con., G. S. L.	Nev..	5,000,000	50,000	100	500,000	July	1886	1.00	4,817,500	July	1882	.25
43	Evening Star, S. L.	Colo.	500,000	50,000	10	*				1,400,000	Nov	1883	.50
44	Excelsior, G.	Cal..	10,000,000	100,000	100	560,000	Sept	1885	1.00	875,000	Oct.	1880	.25
45	Father de Smet, G.	Dak..	10,000,000	100 000	100	200,000	Nov.	1878	1.00	1,125,000	Dec.	1885	.20
46	Franklin, C.	Mich	1,000,000	40,000	25	220,000	Jun.	1871		560,000	Dec.	1886	1.00
47	Freeland, G. S. C.	Colo.	5,000,000	200,000	25	*				190,000	July	1886	.10
48	Fresno Enterprise, G	Cal..	5,000,000	100,000	50			Mch	1883	.10	110,000	July	1882	.10
49	Garfield Lt., G. S.	Nev.	500,000	100,000	5						12,000	Dec.	1883	.12
50	Gould & Curry, G. S.	Nev..	10,800,000	108,000	100	4,109,000	Mar.	1887	.50	3,826,000	Oct.	1870	10.00
51	Grand Central, S.	Ariz.	1,000,000	100,000	10					625,000	Dec.	1882	.25
52	Grand Prize, S.	Nev..	10,000,000	100,000	100	570, 0	Apl.	1886	.50	495,000	Mar.	1881	.25
53	Granite, S.	Colo.	125,000	125,000	1					6,250	May	1883	.01
54	Granite Mountain, S.	Mont	10,000,000	400,000	25					1,900,000	Mar	1887	.25
55	Green Mountain, G.	Cal..	1,250,000	125,000	10	*				212,000	Nov.	1881	.07½
56	Hale & Norcross, G. S	Nev..	11,200,000	112,000	100	5,030,300	Mar.	1887	.50	1,598,000	Apl.	1871	5.00
57	Hall-Anderson, G.	N. S.	150,000	150,000	1					7,000	Jan.	1882	.05
58	Hecla Con., S. G. L. C.	Mont	1,500,000	150,000	50					1,122,000	Jan.	1887	.50
59	Hel'a Mg & Red, G. S. L.	Mont	3,315,000	663,000	5					197,970	July	1886	.06
60	Holmes, S.	Nev..	10,000,000	100,000	100	300,000	Sept	1885	10	75,000	Apl.	1886	.25
61	Holyoke, G.	Idah.	200,000	200,000	1					27 000	Feb.	1883	.10
62	Homestake, G.	Dak.	12,500,000	125,000	100	200,000	July	1878	1.00	3,765,750	Mar.	1887	.20
63	Honorine, S. L.	Utah	5 0,000	250,000	2	25,000	Jun.	1883		87,500	Dec.	1886	.05
64	Hope, S.	Mont	400,000	8,000	50	*				158,252	Oct.	1884	1.50
65	Horn-Silver, S. L.	Utah	10,000,000	400,000	25	*				4,000,000	Nov.	1884	.50
66	Idaho, G.	Cal..	310,000	3,100	100					3,750,000	Jun.	1886	7.50
67	Ideal, S. L.	Colo.	1,500,000	150,000	10					15,000	Oct.	1886	.05
68	Illinois, S.	N. M.	100,000	100,000	1	*				25,000	Jan.	1887	.25
69	Independence, S.	Nev..	10,000,000	100,000	100	340,000	Oct.	1886	.20	225,000	Sept	1879	.25
70	Indian Queen, S.	Nev..	250,000	125,000	2					368,750	July	1883	.03
71	Inyo, G.	Cal..	500,000	100,000	5	*				45,000	Apl.	1882	.05
72	Iron Hill, S.	Dak.	2,500,000	250,000	10	82,500	Oct.	1885		112,500	Oct.	1886	.05
73	Iron-Silver, S. L.	Colo.	10,000,000	500,000	50	*				1,900,000	Mar.	1887	.20
74	Jackson, G. S.	Nev.	5,000,000	50,000	100	10,000	Nov.	1880	.20	45,000	Oct.	1886	.10
75	Jocuistita, S.	Mex.	2,500,000	250,000	10					1,200,000	Feb.	1885	.50
76	Kentuck	Nev..	3,000,000	30,000	100	342,000	Nov	1881	.30	1,600,000	Dec.	1886	.10
77	La Plata, S. L.	Colo	2,000,000	200,000	10	*				610,000	Sept	1882	.30
78	Leadville Cons., S. L. L.	Colo.	4,000,000	400,000	10	*				410,000	Oct.	1886	.05
79	Lexington, G. S.	Mont	4,000,000	40,000	100	*				565,000	Jan.	1885	2.00
80	Little Chief, S. L.	Colo.	10,000,000	200,000	50	*				780,000	Mch	1885	.10
81	Little Pittsburg, S. L.	Colo.	20,000,000	200,000	100	*				1,050,000	Mch.	1880	50
82	Manhattan, S.	Nev.	5,000,000	50,000	100	200,000	Feb.	1887	1.00	437,500	Feb	1886	.25
83	Marguerite, G.	Cal..	500,000	25,000	20					18,750	Oct.	1882	.25
84	Marion Bullion, G	N. C	500,000							15.000	Jan.	1886	
85	Martin White, S.	Nev..	10,000,000	100,000	100	1,150,000	Mar.	1886	25	140,000	Dec.	1886	.25
86	Mary Murphy, G. S.	Colo.	350,000	3,500	100					52,500	Mar.	1886	5.00
87	Minnesota, C.	Mich	1,000,000	40,000	25	430,000	Apl.	1886	1 00	1,826,000	Mar.	1876	
88	Mono, G.	Colo.	5,000,000	50,000	100	560,000	Jun.	1885	.50	12,500	Mar	1886	.25
89	Montana, Lt., G. S.	Mont	3,300,000	330,000	10	*				999,900	Jan.	1887	.62
90	Morning Star, S. L.	Colo.	1,000,000	100,000	10					675,000	Dec.	1886	.25
91	Moulton, S. G.	Mont	2,000,000	400,000	5	*				320,000	Dec	1886	.07½
92	Mount Pleasant, G.	Cal.	150,000	150,000	1	*				150,000	Feb.	1887	.30
93	Mt. Diablo, S.	Nev.	5,000,000	50,000	100	137,500	Jun.	1880	2.00	80,000	July	1885	.20
94	Napa, Q.	Cal..	700,000	100,000	7					290,000	Jan.	1883	.10
95	Navajo, G. S.	Nev..	10,000,000	100,000	100	450,000	Mar.	1887	30	325,000	Feb.	1885	.25
96	N. Hoover Hill, G. S.	N. C.	300,000	120,000	2½	*				30,000	Dec.	1885	.06½
97	New York Hill, G.	Cal..	5,000,000	50,000	100	62,500	Oct.	1885	.15	215,000	Aug.	1882	.10
98	Northern Belle, S.	Nev..	5,000,000	50,000	100	425,000	Jan.	1884	8.30	2,400,000	Apl.	1883	50
99	North Belle Isle, S.	Nev..	10,000,000	100,000	100	250,000	Mar	1887	.50	30,000	Aug.	1881	.15
100	Ontario, S. L.	Utah	15,000,000	150,000	100					8,075,000	Feb.	1887	.50
101	Ophir, G. S.	Nev..	10,000,000	100,000	100	4,007,800	Dec.	1886	.50	1,595,000	July	1882	1.00
102	Original, S. C.	Mont	1,500,000	60,000	25	*				114.000	Oct.	1884	.05
103	Osceola, C.	Mich	1,250,000	50,000	25	480,000	Apl.	1876	1.60	1,022,500	Jan.	1887	1 00
104	Oxford, G.	N. S.	125,000	125,000	1	*				34,530	Oct.	1885	.02
105	Paradise Valley, G. S.	Nev.	10,000,000	100,000	100	47,000	Mar.	1882	.15	140,000	Nov.	1886	.10
106	Peacock, S. G. C.	N. M.	2,000,000	200,000	10	*				60,000	Nov.	1886	
107	Pleasant Valley, G. S.	Cal..	10,000,000	100,000	100	40,000	Mar.	1881	.10	30,000	Dec.	1882	.05
108	Plutus, G. S. C. L.	Colo.	2,000,000	200,000	10	*				20,000	Feb.	1886	.10
109	Plymouth Con., G.	Cal..	5,000,000	100,000	50					1,925,000	Apl.	1887	.25
110	Prussian, S. L.	Colo.	1,500,000	150,000	10					132,000	Jan	1883	.10
111	Quicksilver, pref., Q.	Cal..	4,300,000	43,000	100					849,650	Jan.	1887	1.50
112	" com., Q.	Cal..	5,700,000	57,000	100					151,000	July	1882	.40
113	Quincy, C.	Mich	1,000,000	40,000	25	200,000	Dec.	1862		4,570,000	Jan	1887	4.00
114	Richmond, S. L.	Nev..	1,350,000	54,000	25	*				4,245,087	Dec.	1886	1. 25
115	Ridge, C.	Mich.	500,000	20,000	25	220,000	Mar	1886	.50	100,000	Feb.	1880	.50
116	Rising Sun, S.	Dak..	750,000	150,000	5	*				52,000	May	1881	.07½
117	Robinson Con., S. L.	Colo.	10,000,000	200,000	50	*				585,000	Mar.	1886	.05
118	Robert E. Lee, S. L.	Colo	10,000,000	500,000	20					100,000	Dec.	1882	.10
119	Rooks, G.	Vt...	500,000	50,000	10	*				61,000	Apr.	1885	.30
120	San Francisco, C.	Cal..	5,000,000	50,000	100	45,000	Sept	1880	.50	20,000	Feb.	1883	.05
121	Savage, S.	Nev..	11,200,000	112,000	100	6,156,000	Jun.	1886	.50	4,460,000	July	1869	3.00
122	Security L. Mg., Mfg.	Colo.	1,000,000	100,000	10	*				50,000	July	1884	
123	Shoshone, G.	Idah.	150,000	150,000	1					7,500	Apl.	1883	.01
124	Sierra Buttes, G.	Cal..	225.000	22,500	10					1,438,934	Oct.	1886	.37
125	Sierra Grande, S.	N. M.	2,500,000	500,000	5					860,000	Sept	1884	.25
126	Sierra Nevada, G. S.	Nev..	10,000,000	100,000	100	6,212,000	Mar.	1887	.50	102,000	Jan.	1871	1.00
127	Silver Cord, G. S. L.	Colo.	5,000,000	500,000	10					225,000	Nov.	1883	.25
128	Silver King, S.	Ariz.	10,000,000	100,000	100					1,850,000	Feb.	1887	.25
129	Silverton, G. S. L.	Colo.	2,000,000	200,000	10	*				76,000	Nov.	1886	.02
130	Small Hopes Cons., S.	Colo.	5,000,000	250,000	20	*				2,612,500	Feb.	1887	.20
131	Smuggler, S. L.	Colo.	600,000	60,000	10					66,700	Aug.	1883	.25
132	Socorro, C.	N. M.	250.000	2,500	100					4,000	Mch	1882	.00¼
133	South Yuba, G.	Cal..	2,000,000	0 000	50	*				150,000	Oct.	1881	.75
134	Spring Valley, G.	Cal..	200,000	200,000	1	50,000	Oct.	1886	.25	50,000	Jan.	1881	.25
135	Standard, G. S.	Cal..	10 000,000	100,000	100	25,000	Oct.	1884	.25	4,425,000	Mar.	1884	.25
136	Stormont, S.	Utah	500,0 0	500,000	1	*				155,000	Nov.	1881	.05
137	St. Joseph, L.	Mo..	1,500,000	150,000	10	*				754,000	Mar.	1887	.20
138	Syndicate, G.	Cal..	10,000,000	100,000	100	33,729	July	1882	.15	48,308	Sept	1885	.10
139	Tip Top, S.	Ariz.	10,000,000	100,000	100	250,000	Sept	1883	.25	100,000	Nov.	1881	.20
140	Tombstone, G. S. L.	Ariz.	12,500,000	500,000	25	*				1,250,000	Apl.	1882	.10
141	True Fissure, G. S. L.	Utah	1,500,000	150,000	10	*				75,000	Jun.	1883	.15
142	United Verde, C.	Ariz.	3,000,000	300,000	10	*				97,500	Feb.	1884	.20
143	Valencia, M.	N. M.	150,000	1,500	100	*				37,500	Apl	1886	2.50
144	Viola Lt., S. L.	Idah.	750,000	150,000	5	*				55,750	Feb.	1887	.12½
145	Vizina, S.	Ariz..	5,000,000	200,000	25	*				140,000	Apl.	1882	.10
146	Yankee Girl	Colo.	2,500,000	250,000	10					1,075,000	Jan.	1887	.05
147	Yellow Jacket, G. S.	Nev..	12,000,000	12,000	100	5,448 000	Dec.	1883	.75	2,184,000	Aug.	1871	1.50

NON-DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par Value.	Assessments. Total levied to date.	Assessments. Date and amount per share of last.			
1	Agassiz Cons., S. L.	Colo.	$2,500,000	50,000	$50	*				
2	Albion, S. L.	Nev..	15,000,000	150,000	100	$577,000	July	1883	.50	
3	Allouez, C.	Mich	2,000,000	80,000	25	240,000	Feb.	1884	.50	
4	Alpha Con., G. S.	Nev..	3,000,000	30,000	100	445,000	Jan.	1887	.50	
5	Alta, S.	Nev..	10,080,000	100,800	100	2,027,000	Feb.	1887	50	
6	Amador, G.	Cal..	400,000	200,000	2	*				
7	American Flag, S.	Colo.	1,250,000	125,000	10	300,000	Jun.	1877	.25	
8	Anglo-Montana, Lt.	Mon.	600,000	120,000	5					
9	Appalachian, Lt., G.	N. C.	1,500,000	300,000	5					
10	Aspen Mg. & S., S. L.	Colo.	2,000,000	200,000	10					
11	Barcelona, G.	Nev..	5,000,000	200,000	25	*				
12	Battle Creek, G.	Dak..	5,000,000	200,000	25					
13	Bear Creek	Cal.	300,000	300,000	1					
14	Bechtel Con., G.	Cal..	10,000,000	100,000	100	173,500	Jan.	1883	.10	
15	Belmont, S.	Nev..	5,000,000	50,000	100	735,000	Apl.	1886	.10	
16	Best & Belcher, G. S.	Nev.	10,080,000	100,800	100	1,798,900	Mar.	1887	.50	
17	Big Pittsburg, S. L.	Colo.	20,000,000	200,000	100	*				
18	Bi-Metallic, S.	Mon.	5,000,000	200,000	25	*				
19	Black Jack, G.	Cal..	250,000	100,000	2½					
20	Bonanza Chief	Mon	1,000,000	1,000,000	1	*				
21	Bondholder	Colo.	500,000	200,000	2½					
22	Boston Con., G.	Cal..	13,000,000	100,000	100	170,000	Nov	1883	.25	
23	Bradshaw, S.	Ariz.	2,250,000	225,000	10					
24	Brunswick, G.	Cal..	2,000 000	400,000	5	*				
25	Bullion, G. S.	Nev..	10,000,000	100,000	100	5,000,000	Jan.	1887	.40	
26	Bve and Bye	Ariz.	1,000,000	100,000	10	*				
27	Calaveras, G.	Cal..	500,000	500,000	1	*				
28	Carisa, G.	Wy..	500,900	100,000	5	*				
29	Catskill, S.	Nev..	1,500,000	300,000	5					
30	Cen Contin'l, G. S. L.	C. & A	2,000,000	200,000	10	*				
31	Charles Dickens.	Idah.	1,250,000	250,000	5					
32	Cherokee, G.	Cal..	1,500,000	150,000	10					
33	Chollar, S.	Nev..	11,200,000	112,000	100	1,096,000	Nov	1886	.50	
34	C nnamon Mt., G. S.	Colo.	750,000	150,000	5					
35	Climax, S. L.	Colo.	2,000,000	200,000	10	*				
36	Colorado No. 2, S. L.	Colo.	100,000	10,000	10					
37	Con. Imperial, G. S.	Nev..	50,000,000	500,000	100	1,100,000	Aug.	1886	.10	
38	Con. Pacific, G.	Cal..	6,000 000	60,000	100	174,000	Feb.	1886	.15	
39	Cons Silver, S.	Mo..	2,500,000	250,000	10					
40	**Cop. Queen Cons, C.	Ariz.	1,400 000	140,000	10					
41	Courtlandt	Colo.	500,000	50,000	10					
42	Crescent, S. L.	Colo.	3,000,000	300,000	10	*				
43	Crocker, S.	Ariz.	10,000,000	100,000	100	65,000	May	1886	.20	
44	Crowell, G.	N. C.	500,000	500,000	1					
45	Dahlonega, G.	Ga..	250,000	250,000	1	*				
46	Dandy, S.	Colo.	5,000,000	500,000	10					
47	Dardanelles, G.	Cal..	1,000,000	100,000	10					
48	Decatur, S.	Colo.	1,500,000	300,000	5	*				
49	Denver City, S. L.	Colo.	5,000,000	500,000	10	*				
50	Denver Gold	Colo.	300,000	60,000	5					
51	Deseret, G. S.	Utah	500,000	50,000	10	*				
52	Dunderberg, S.	Colo.	1,500,000	150,000	10	*				
53	Durango, G.	Colo.	500,000	500,000	1	*				
54	Durango T.	Mex.	120,000	1,200	100					
55	Eastern Dev. Co., Lt.	N. S.	1,500,000	150 000	10	990,000	Mar.	1886	1.00	
56	El Cristo, G. S.	U.S.C	1,000,000	500,000	2					
57	Empire Lt., G.	Mon.	500,000	100,000	5					
58	Empire, S.	Utah	10,000,000	100,000	100					
59	Enterprise, S. L.	Colo.	800,000	80,000	10	*				
60	Eureka Tunnel, S. L.	Nev..	10,000,000	100,000	100	*				
61	Exchequer	Nev..	10,000,000	100,000	100	860,000	Oct.	1886	.20	
62	Gold Cup, S.	Colo.	500,000	500,000	1	*				
63	Gold Placer, G.	Colo.	5,000,000	200,000	2 5	229,314	Dec.	1885	.25	
64	Goodshaw, G.	Cal..	10,000,000	100,000	100	*				
65	Grand Belt, C.	Tex.	12,000,000	120,000	100					
66	Grand Duke	Colo.		800,000	80,000	10				
67	Gregory-Bobtail, G.	Colo.	550,000	550,000	1	*				
68	Gregory Con., G.	Mon.	3,000,000	300,000	10					
69	Hariem M. & M. Co., G.	Cal..	1,000,000	200,000	5					
70	Head Cent. & Tr. & G.	Ariz.	10,000,000	100,000	100					
71	Hidalgo, S.	Mex.	200,000	20,000	10					
72	Highland, C.	Mich	500,000	25,000	25					
73	Hortense, S.	Colo.	2,000,000	200,000	10					
74	Iron Gold & Silver, S.	N. M.	2,000,000	200,000	10					
75	Iroquois, C.	Mich	1,250,000	50,000	25					
76	J. D. Reymert	Ariz.	10,000,000	100,000	100	*				
77	Julia Cons., G. S.	Nev..	11,000,000	110,000	100	1,438,000	Nov	1885	.10	
78	Kearsarge, C.	Mich	1 250,000	50,000	25	100,000	Apl.	1886	5.00	
79	Laclede	N. M.	2,000,000	200,000	10					
80	Lacrosse, G.	Colo.	1 000,000	100,000	10	*				
81	Lee Basin, S. L.	Colo.	5,000,000	500,000	10	*				
82	Leviathan, S.	Nev..	10,000,000	100,000	100	380,000	Sept	1882	.25	
83	Lucerne, S.	Colo.	5,000,000	500,000	10	*	Jan.	1885	.10	
84	Mammoth Bar., G.	Cal..	10,000,000	100,000	100	50,000	Dec.	1881		
85	Mariposa pref., G.	Cal..	5,000,000	50,000	100	1,687,500	Feb.	1883	.25	
86	" common, G.	Cal..	10,000,000	100,000	100	1,975,000	Dec.	1881	.20	
87	May Belle, G.	Cal..	10,000,000	100,000	100	84,000	Mar.	1884	.15	
88	Mayflower Gravel	Cal.	1,000,000	100,000	100	135,000	Jan.	1887	.25	
89	Mexican, S.	Nev..	10,000,000	100,800	100	2,590,960	Jan.	1887	.25	
90	Middle Bar, G.	Cal.	400,000	200,000	2	*				
91	Mine & Smarr, S. L.	Colo.	1,000,000	200,000	5	*				
92	Miner Boy, G. S. L.	Colo.	5,000,000	500,000	10	*				
93	Miller	Nev.	5,000,000	200,000	25					
94	Moose Silver, S.	Colo.	3,000,000	300,000	10	*				
95	Nachoochee, Lt., G.	Ga..	1,000,000	200,000	5					
96	New Germany, G.	N. S.	100,000	100,000	1	*				
97	New Pittsburg, S. L.	Colo.	2,000,000	200,000	10	*				
98	North Standard, G.	Cal..	10,000,000	100,000	100	20,000	Nov			
99	Noonday	Cal..	600,000	60,000	10	208,000	Dec.	1881	.10	
100	Old Dominion, C.	Ariz.	3,000,000	300,000	10					
101	Oriental	Nev..	2,000,000	200,000	10					
102	Oriental & Miller, S.	Nev..	10,000,000	400,000	25					
103	Overman, G. S.	Nev..	11,520,000	115,200	100	3,736,880	Jan.	1887	.50	
104	Parrott, C.	Mon.	1,800,000	180,000	10					
105	Park, S.	Utah	2,000,000	200,000	10					
106	Peer, S.	Ariz.	10,000,000	100,000	100	135,000	Nov.	1886	.10	
107	Peerless, S.	Ariz.	10,000,000	100,000	100	295,000	Nov.	1886	.20	
108	Phœnix	Ariz.	500,000	500,000	1					
109	Phœnix Lead	Colo.	100,000	100,000	1	*				
110	Potosi	Nev..	11,200,000	112,000	100	1,145,600	Mar.	1887	.30	
111	Puritan, S. G.	Colo.	1,500,000	150,000	10	*				
112	Quincy	Colo.	3,000,000	300,000

NEW YORK MINING STOCK QUOTATIONS.

DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	March 12.*		March 14.		March 15.		March 16.		March 17.		March 18.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Alice, Mon	.....	.....	1.60	.....	1.60	1.50	1.50	.....	1.15	.....	1.50	1.45	1,600
Argenta, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bassick, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Belle Isle, Nev	.51	.....	.55	.....	.....	.....	.....	.....	2.85	2.80	2.75	.....	200
Bodie Cons., Cal	.....	.....	2.85	.....	.....	.....	.....	.....	.....	.....	.....	.....	525
Breece, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.52	.50	400
Bulwer, Cal	.....	.....	.....	.....	1.20	.....	.....	.....	1.30	.....	.....	.....	200
Caledonia, Dak	.....	.....	.....	.....	1.30	.....	1.30	.....	1.30	.....	.....	.....	1,000
Cholliar, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chrysolite, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Colorado Cent'l, Colo	.....	.....	3 00	.....	2.75	.....	2.75	.....	.....	.....	.....	.....	300
Cons. Cal. & Va., Nev	20.00	18.63	.....	.....	.....	.....	.....	.....	17.50	.....	16.50	.....	799
Crown Point, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Deadwood, Dak	.....	.....	2.25	.....	.....	.....	.....	.....	.....	.....	.....	.....	50
Dunkin, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Eureka Cons., Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Father de Smet, Dak	.....	.....	.....	.....	.....	.....	.75	.....	.....	.....	.....	.....	400
Freeland, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gold Stripe, Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gould & Curry, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Green Mountain, Cal	.40	.....	.....	.....	40	.39	.40	.39	.....	.....	.....	.....	900
Hale & Norcross, Nev	5.75	.....	.....	.....	.....	.....	.....	.....	.....	.....	5 25	.....	400
Homestake, Dak	.....	.....	.....	.....	15.50	14.00	15.00	.....	15.00	.....	15.75	15.13	500
Horn-Silver, Ut	.....	.....	.....	.....	1.25	.....	.....	.....	.....	.....	.....	.....	300
Independence, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Iron Hill, Dak	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.80	.....	200
Iron Silver, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Leadville C., Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.70	.69	300
Little Chief, Colo	.20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,000
Little Pittsburg, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Martin White	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Moulton, Mont	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Navajo, Nev	.95	.....	.90	.....	.85	.....	82	80	.80	.77	.....	.....	3,400
North Belle Isle, Nev	4.90	4.85	.....	.....	4 75	.....	4.75	.....	.....	.....	4 50	.....	710
Ontario, Ut	.....	.....	.....	.....	25 50	.....	.....	.....	.....	.....	25.50	.....	110
Ophir, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Plymouth, Cal	.....	.....	17.25	.....	17.13	.....	.....	.....	.....	.....	17.25	.....	430
Quicksilver Pref., Cal	31.63	31.50	.....	.....	31.50	31.25	31.25	.....	.....	.....	.....	.....	800
" Com., Cal	.....	.....	7.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	200
Robinson Cons., Colo	.....	.....	.....	.....	.40	.....	.....	.....	.....	.....	.....	.....	200
Savage, Nev	6.75	.....	7.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	200
Sierra Nevada, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Silver King, Ariz	8.00	.....	.....	.....	.....	.....	.....	.....	8 00	.....	.....	.....	125
Standard, Cal	1 00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	100
Stormont, Ut	.12	.11	.....	.....	.....	.....	.....	.....	.12	.....	.....	.....	2,100
Yellow Jacket, Nev	5.75	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	25
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
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NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	March 12.		March 14.		March 15.		March 16		March 17.		March 18.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Amador, Cal	1.55	1.50	1.60	.....	1.65	1.60	1 65	1.50	1 65	1.55	1.70	1.60	11,900
Am. Flag, Colo	.....	.....	.....	.....	.....	.....	.10	.....	.....	.....	.10	.....	600
Barcelona, Nev	.....	.....	.30	.28	30	.29	.32	.....	.32	.31	.31	.....	6,600
Bechtel Con., Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Belcher, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Best & Belcher, Nev	11 25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	200
Big Pittsb'g, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bullion, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bull-Domingo, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Castle Creek, Id	.14	.....	.....	.....	.12	.11	.13	.....	.13	.....	.15	.14	6,400
Central Ariz, Ariz	.....	.....	.....	.....	.....	.....	.14	.....	.....	.....	.....	.....	100
Columbia & Beaver	.06	.....	.....	.....	.05	.....	.....	.....	.03	.....	.....	.....	900
Cons. Imperial, Nev	2 75	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	300
Con. Pacific, Cal	.....	.....	.....	.....	.32	.30	.30	.28	.....	.....	.....	.....	700
Durango	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Eastern Oregon	.02	.....	.....	.....	.02	.....	.....	.....	.....	.....	.03	.02	7,500
El Cristo, U. S. Col	6.25	6.00	6.25	6.00	6.25	6.00	6.25	6.00	6.25	6.13	6.37	6.25	26,600
Gold Cup	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Goodshaw, Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hariem, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Idyoke	.15	.14	.15	.....	.15	.....	16	.15	.16	.14	.17	.15	24,000
Julia, Nev	1.10	.....	.....	.....	.....	.....	.....	.....	1.00	.....	.....	.....	200
Justice, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kossuth, Nev	.19	.....	.....	.....	.14	.....	.....	.....	.....	.....	.....	.....	500
Lacrosse, Colo	.15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	400
Mexican, Nev	.....	.....	.....	.....	.....	.....	5.87	.....	.....	.....	.....	.....	25
Middle Bar, Cal	.85	.80	.81	.76	.84	.75	.86	.75	.98	.86	1.00	.92	166,500
Mono, Cal	.....	.....	.....	.....	.....	.....	2 50	.....	.....	.....	.....	.....	100
New Germany, N. S.	.62	.61	.63	.59	.54	.51	.53	.51	.54	.52	.55	.54	15,500
New Pittsb'g, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
North Stand'd, Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
N. Horn-Silv'r, Ut	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ori'nt'l&Mil'r, Nev	.27	.26	.25	.....	.25	.....	.....	.....	.....	.....	.28	.....	7,800
*Phœnix, Ariz	5.87	3.00	4.50	3.00	3.75	3.25	3.50	3.25	3.62	3.25	3.75	3.50	109,370
Potosi, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rappahannock, Va	.17	.16	.16	.....	.17	.....	.17	.16	.....	.....	.16	.15	7,100
Red Eleph't, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
" 2 and 3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Security, Colo	7.00	6.50	7.25	6.50	7.50	6.50	7.50	7.00	7.25	6.87	7.12	6.87	32,475
Silver Cliff, Colo	.14	.....	.....	.....	.14	.....	.14	.....	.....	.....	.....	.....	300
Silver Queen	.....	.....	.22	.....	.....	.....	.22	.....	.....	.....	.22	.21	3,300
Sonora Con., Mex	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Stanislaus, Cal	3.55	3.25	3.55	3.30	3.50	3 30	3.55	3.40	3.55	3.40	3.55	3.40	10,700
State L'e, 1&4, Nev	05	.....	.....	.....	.05	.04	.04	.....	.05	.....	.05	.....	4,800
" Nos. 2 & 3, Nev	.....	.....	.....	.....	.05	.....	.....	.....	.05	.....	.05	.....	3,100
Sutro Tunnel, Nev	.23	.22	.23	.22	.....	.....	.22	.21	.22	.....	.22	.....	19,400
Taylor Plumas, Cal	.08	.07	.08	.07	.08	.07	.09	.08	.09	.....	.08	.....	21,300
Tioga, Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Unadilla, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Union Cons., Nev	4.15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	200
Utah, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

* Dealt in at the New York Stock Exchange, Unlisted Securities.

BOSTON MINING STOCK QUOTATIONS.

NAME OF COMPANY.	Mar. 11.		Mar. 12.		Mar. 14.		Mar. 15.		Mar 16.		Mar 17.		SALES.
Amie	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Allouez	1.90	.....	1.75	.....	.....	.....	1.87	.....	1.75	.....	.....	.....	400
Atlantic	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bodie	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bonanza D	1.75	1.6	1.63	1.50	1.50	.....	1.50	.....	1 50	.....	1.50	.....	4,225
Boston & Montana	42½	.....	4.25	.....	.....	.....	.....	.....	.....	.....	8.75	.....	1,100
Breece	42½	.....	.....	.....	.....	.....	.....	.....	.....	.....	.50	.....	450
Calumet & Hecla	.....	.....	218	.....	.....	.....	.....	.....	212	210	212	.....	22
Catalpa	35	.....	37½	35	40	.....	40	.....	37½	35	.....	.....	1,850
Central	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chrysolite	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.70	.....	75
Con. Virginia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dunkin	96	.....	.36	.....	.....	.....	.36	.....	.....	.....	.36	.....	1,300
Eureka	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Franklin	12 25	.....	12.50	.....	12.00	11.75	11.75	11.50	11.50	.....	.....	.....	500
Freeland	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Helena	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Honorine	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Little Chief	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Osceola	20.50	.....	.....	.....	.....	.....	21.75	.....	.....	.....	.....	.....	100
Pewabic	2.00	.....	2.00	.....	2.00	.....	.....	.....	.....	.....	.....	.....	175
Quincy	53	.....	53	.....	.....	.....	53	50	.....	.....	50.50	.....	264
Robinson	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Security	.....	.....	6.75	.....	.....	.....	.....	.....	7.25	.....	.....	.....	150
Silver King	.....	.....	.....	.....	.....	.....	.....	.....	8.00	.....	.....	.....	40
Standard	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Stormont	.10	.....	.13	.....	.....	.....	.13	.....	.....	.....	.12	.....	1,300

NAME OF COMPANY.	Mar. 11.		Mar. 12.		Mar. 14.		Mar. 15.		Mar. 16.		Mar. 17.		SALES.
Alma	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Arnold	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bijou	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Blue Ridge	.20	.....	.20	.....	.....	.....	.18	.....	.20	.....	.21	.20	2,000
Bowman Silver	.13	.12	.12	.....	.....	.....	.12	.....	.12	.....	.....	.....	2,400
Cliff	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Con. Pacific	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Crescent	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cusi	.35	.....	.34	.....	.....	.....	.....	.....	.....	.....	.24	.....	900
El Cristo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Empire	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fern	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Humboldt	.....	.....	.15	.....	.....	.....	.....	.....	.....	.....	.....	.....	100
Huron	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.87	.....	100
Mesnard	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mona	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Napa	.90	.....	.95	.....	.....	.....	.....	.....	.....	.....	.....	.....	300
National	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.75	.....	100
Native	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Oriental & Miller	.29	.....	.26	.....	.....	.....	.....	.....	.25	.....	.26	.....	1,600
Plato	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ridge	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rappahannock	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.17	300
St. Mary's	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sutro Tunnel	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tamarack	.93	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	55
Washington	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

New York: Dividend shares sold, 17,474. Non-dividend shares sold, 498,370. Total New York, 515,844.
Boston: Dividend shares sold, 12,651. Non-dividend shares sold, 7,855. Total Boston, 20,506.

COAL STOCKS.

NAME OF COMPANY.	Par value of shares.	March 12.		March 14.		March 15.		March 16.		March 17.		March 18.		Sales.
		H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Barclay Coal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cameron Coal	50	46¼	45	45½	.....	45½	.....	45¾	45¼	45⅝	.....	45½	.....	1,215
Col., C. & I	100	37½	37¼	37¼	37	37½	.....	39⅞	38	39	38¾	39¼	38¾	9,455
Ches. & O. RR	100	.....	.....	8¼	8	.....	.....	.....	.....	.....	.....	.....	.....	100
*Chic. & Ind. Coal RR	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Col. & Hocking Coal	.....	39¾	39¼	39¼	.....	39¼	38¾	39¾	39½	39¾	39½	39¼	.....	1,500
Consol. Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cumb. C. & I	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Del. & H. C	100	101⅛	100⅝	101⅛	101⅛	101¼	100⅜	101⅛	101	101¼	.....	101¼	100⅞	4,767
D., L. & W. RR	50	134	133⅛	134⅛	132½	134	133⅜	134¼	133⅝	134	133¼	134⅛	133⅜	107,790
Elk Lick Coal Co	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hocking Valley	100	34⅝	33⅞	33¾	28⅞	31	29¾	32¼	30½	31½	30¾	31½	29½	31,684
Lehigh C. & N.†	50	50	.....	50½	50	50½	50	.....	.....	50	.....	.....	.....	1,777
Lehigh Valley RR.†	50	56¾	.....	56½	56	56½	56	.....	.....	56⅛	56	.....	.....	1,212
L. & W. C. & I. Co	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Maryland Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Montauk Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Morris & Essex	50	130½	.....	132	130⅛	132¼	132	136	132½	136⅞	135¾	136½	136	3,676
New Central Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	12½	.....	13½	13⅜	165
N. J. C. RR	100	69½	69⅛	69½	68¼	69⅝	68¾	70⅝	69¼	70½	70	70⅜	70	20,940
N. Y. & S. Coal	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
N. Y., Susq. & Western	100	13	12¾	12¾	.....	13	12⅝	12¾	.....	.....	.....	.....	.....	1,270
Do. pref	100	35¾	35⅝	36	34¾	35¾	35¼	35¼	.....	35¼	.....	.....	.....	2,357
N. Y. & Perry C. & I	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Norfolk & Western R R.	100	21⅛	21	20	.....	21¼	.....	21	.....	.....	.....	21¾	.....	620
Do. pref	100	48⅛	47¾	48⅛	47⅛	49	48	49¼	48⅞	49⅛	48⅞	49⅛	49	7,680
Penn. Coal	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Penn. RR.†	50	57⅞	57⅝	57⅞	57⅝	57¾	57½	.....	.....	58	57½	.....	.....	5,806
Ph. & R. RR.**	50	38¼	37¾	38¼	37	38	37⅛	38½	37¾	38	37½	38¼	38	190,110
Spring Mountain	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tennessee C. & I. Co	100	45	43⅜	.....	.....	45	43½	45½	45	43¾	.....	44¾	.....	1,600
Westmoreland Coal†	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

** Of the sales of this stock, 35,855 were in Philadelphia, and 154,255 in New York.
† The quotations for these stocks are not percentage, but actual price.
* Dealt in at the New York Stock Exchange, Unlisted Securities.

Total sales, 393,724.

San Francisco Mining Stock Quotations.

COMPANY.	CLOSING QUOTATIONS.					
	Mar. 11.	Mar. 12.	Mar. 14.	Mar. 15.	Mar. 16.	Mar. 17.
Albion	.....	.....	.....	.....	.....	.....
Alpha	.....	.....	.....	.....	.....	.....
Alta	1⅝	2⅛	2⅛	2¾	2⅝	2¼
Argenta	.....	.....	.....	.....	.....	.....
Bechtel	.....	.....	.....	.....	.....	.....
Belcher	.....	.....	.....	.....	.....	.....
Belle Isle	.....	.....	.....	.....	.....	.....
Best & Belcher	10⅞	12⅛	11⅛	10⅝	10⅜	9½
Bodie	2⅞	3	3	2⅞	3	2⅞
Bulwer	1¼	.....	1¼	1⅛	1⅛	1¼
Chollar	7⅞	8⅞	8⅛	7¾	7½	6⅝
Con. Cal. & Va.	18	19⅛	18⅞	17½	17½	17
Con. Pacific	.....	.35	.....	.30	.....	.30
Crown Point	4⅜	4¾	4⅝	4¾	4½	4½
Eureka Cons	6	.....	6	.....	.....	.....
Gould & Curry	5½	6	5⅝	5⅝	5⅛	5
Grand Prize	.....	.....	.....	.....	.....	.....
Hale & Norcross	5⅝	5⅞	5⅝	5⅜	5¼	5
Martin White	.....	.....	.....	.....	.....	.....
Mexican	6½	7	6¾	6⅝	6¼	5⅞
Mono	2¾	2¾	2⅝	2⅝	.....	2½
Mount Diablo	4	.....	4	.....	.....	4¼
Navajo	.95	1	.95	.90	.80	.80
Ophir	10⅞	12⅜	11⅝	10⅝	10¼	10¼
Potosi	9	10	9¼	9⅛	8⅝	8¼
Savage	6	6¾	6⅝	5⅝	5⅝	5¼
Scorpion	.....	.....	.....	.....	.....	.....
Sierra Nevada	5⅛	5½	5⅛	5⅛	4¾	4⅝
Sutro Tunnel	.....	.....	.....	.....	.....	.....
Tip Top	.....	.....	.....	.....	.....	.....
Union Cons	4½	4½	4½	4	4	3¾
Utah	1¾	1¾	1¾	1⅝	1⅛	1⅛
Yellow Jacket	5⅞	6⅛	6	6	5⅓	5

Company and the Senate Mining and Smelting Company.

Consignee Gravel Gold Mining Company, No. 10½ Sixth street, Pittsburg, Pa., March 23d, at two o'clock P.M.

Huron Copper Mining Company, No. 19 Congress street, Rooms 11 and 12, Boston, Mass., April 6th, at twelve o'clock M.

Mammoth Coal and Iron Company, No. 227 South Fourth street, Philadelphia, Pa., March 30th, at twelve o'clock M.

Dividends.

Big Bend Hydraulic Company, of Dakota, has declared a dividend, No. 38, of three cents per share, or $6000.

Homestake Mining Company, of Dakota, has declared a dividend, No. 104, of twenty cents per share, or $25,000, payable on the 25th inst.

Lehigh Zinc and Iron Company, of Pennsylvania, will redeem at par one hundred and twenty shares of its preferred capital stock—being Nos. 1 to 120, inclusive, and amounting to $12,000—on April 1st, from and after which date all dividends thereon will cease.

Plymouth Consolidated Gold Mining Company, of California, has declared a dividend, No. 47, of twenty-five cents per share, or $25,000, payable April 5th.

St. Joseph Lead Company, of Missouri, has declared a dividend of twenty cents per share, or $30,000, payable on the 21st inst.

Pipe Line Certificates.

Messrs. Watson & Gibson, petroleum brokers, No. 49 Broadway, report as follows for the week :

There has been a little improvement in prices this week, owing to the expectation that the storage rates would be reduced. This was effected Thursday, but the market was flat and appeared to be indifferent to the change. There is no public interest in it.

The following table gives the quotations and sales at the Consolidated Stock and Petroleum Exchange :

	Opening.	Highest.	Lowest.	Closing.	Sales.
Mar. 12.....	6 3/8c.	64¼c	62⅝c.	63c.	2,637,000
14	63⅛	63¾	62¾	63	1,688,000
15	63⅜	63½	63⅛	63¼	810,000
16.....	63¼	64⅞	63⅛	64¾	3,560,000
17.....	65	65⅝	62½	63¾	5,637,000
18.....	64	64⅞	63	64¾	2,645,000
Total sales in barrels.....					16,977,000

Assessments.

Company.	No.	When levied.	Delinquent in office.	Day of sale.	Amount
Alta, Nev.....	35	Feb. 9	Mar. 16	April 5	.50
America, Nev.....	1	Jan. 31	Mar. 8	Mar. 31	.05
Andes, Nev	31	Jan. 24	Mar. 3	Mar. 23	.25
Belle Isle, Nev.....	10	Feb. 9	Mar. 16	Apr. 7	.20
Benton Cons., Nev...	17	Jan. 28	Mar. 4	Mar. 24	.25
Best & Belcher, Nev.	36	Mar. 8	Apr. 15	May 5	.50
Bodie, Cal	6	Jan. 24	Feb. 28	Mar. 28	.50
Caledonia, Nev.	...	Mar. 1.	.....	.....	.15
Camp Creek Placer, Cal	1	Jan. 20	Mar. 10	Apr. 14	.10
Comstock, Nev.....	...	Mar. 16	.....	.....	.15
Dolores Con., Nev...	4	Mar. 2	Apr. 11	Apr. 29	.05
General Crook, Dak..	3	Feb. 12	Apr. 1	Apr. 15	½
Golden Fleece, Cal..	8	Jan. 27	Mar. 8	Mar. 28	.10
Gould & Curry, Nev.	55	Mar. 8	Apr. 11	May 4	.50
Hale & Norcross, Nev	...	Mar.	.....	.....	.50
Hazard, Cal.	1	Jan. 26	Mar. 1	Mar. 22	.03
Keokuk, Dak.....	3	Dec. 20	*Mar 15	*Apl. 1	¼
Lady Wash'gtn, Nev.	6	Jan. 28	Mar. 7	Mar. 28	.25
Lone Jack, Cal.....	1	Jan. 27	Mar. 7	Mar. 28	.05
Manhattan, Nev....	4	Feb. 2	Mar. 7	Mar. 22	1.00
McDonell, Dak.....	2	Feb. 26	Apr. 4	Apr. 23	½
Navajo, Nev.....	...	Mar. 14	.....	.....	.30
New Era, Dak.....	12	Mar. 1	Apr. 2	Apr. 18	½
Nevada Queen, Nev.	1	Mar. 10	.....	.....	.50
North Belle Isle, Nev	2	Mar. 14	.....	.....	.50
Occidental, Nev.....	8	Feb. 3	Mar. 10	Mar. 31	.40
Phœnix Cons., Cal..	2	Jan. 26	Mar. 5	Mar. 28	1 40
Potosi, Nev.....	...	March.	.....	.....	.30
Ruby Hill, Nev	13	Mar. 4	Apr. 5	May 5	.01
Sampson S., Utah...	....	Mar. 7	Apr. 11	May 9	.25
Seabury-Calkins Cons., Dak	5	Mar. 1	Apr. 9	Apr. 30	.01
Sierra Iron, Cal.....	6	Feb. 17	Mar. 30	Apr. 23	2.50
Silver Reef, Dak.....	2	Mar. 1	Apr. 2	Apr. 18	1/6
U. S. Grant, Dak. ...	1	Mar. 2	Apr. 4	Apr. 23	¼
West Galena, Dak....	5	June 5	*Apr. 1	*Apr 19	1/6

* The delinquent day and the day of sale were postponed to dates given above.

Gogebic Iron Stocks.

Developments are being pushed energetically along the entire range, preparatory to the opening of navigation, and from the present outlook fully 1,500,000 tons will be shipped during the coming season. Sales for over 1,000,000 tons have already been made at prices ranging from $5.75 to $6 per ton. Recent developments in many of the leading properties continue to show an increased width of ore-bodies as depth is gained, which in character are first-class Bessemer ores. The interest here in these stocks is increasing, and values of well developed properties have steadily advanced. Much activity was displayed in the Sunday Lake Bessemer and Iron Chief. The parties who recently acquired the controlling interests in these properties are improving the facilities for handling the ore, and each of these mines, as well as the Iron King and Bonnie, are expected to produce largely the coming season. A three years' contract has been made for the shipment of ore from the Aurora. The Norrie paid a dividend of three dollars per share on the 15th inst.

Name.	No. of shares.	Pres't value.	Name.	No. of shares.	Pres't value.
Aurora	100,000	$20.00	Laura	40,000	$4.00
Anvil	40,000	8.00	Montreal	20,000	32.00
Amazon	40,000	4.00	Moore	40,000	4.25
Ashland	40,000	35.00	Mikado	40,000	3.50
Agogebic	40,000	2.00	Minnewawa..	40,000	5.00
Atlantic	40,000	8.00	Nimikon ...	40,000	11.50
Berringer....	100.000	2.50	Nort'n Chief	30,000	100.00
Bonnie.	40,000	10.00	Norway.. ..	20,000	2.50
Blue Jacket.	40,000	8.50	Norrie	30,000	36.00
Black River..	20,000	20.00	Odanah	20,000	11.00
Bessemer....	20,000	9.75	Old Nokomis	40,000	2.25
Brotherton..	80.000	6.25	Pabst.....	250	.....
Bourne	40,000	5.00	Puritan.....	40,000	23.00
Crown Point.	100,000	2.00	Pence & Snyder I. D.Co.	100,000	3.75
Caledonia....	40,000	3.25	Pence.....	40,000	4.75
Colby.....	*	*	Penokee & G. D. Co	5,000	500.00
Emma	40,000	3.25	Palens.....	40,000	6.00
Father Hennepin.....	40.000	4.00	Ryan	40,000	6.00
First Nation'l	80,000	5.50	Superior.....	100,000	3.50
Flor'ce May.	40,000	2.75	Section 33 Co	20,000	11.00
Germania ...	40,000	16.00	Sunday Lake	40,000	7.75
Gogebic I. Sy	200,000	5.50	Snider	40,000	5.00
Gogebic R. & I. Co. (fee)..	40,000	5.00	Trimble	40,000	7.00
Gogebic ...	40,000	3.00	Tontine	40,000	5.00
Iron King. ..	40,000	20.00	Union	40,000	3.50
Ironton.....	40,000	11.00	United I. & L. Syndicate .200,000		1.00
Iron Prince..	40,000	3.25	*W L.& Min'l	90,000	1.00
Ironsides	40,000	3.00	Valley.....120,000		3.50
Iron Chief...	40,000	6.00			
Kakagon	40,000	14.50			

*See Penokee & Gogebic Development Company. † Includes fee.

The shares of the above companies all have a par value of $25, excepting the Pabst, the Penokee, and the Gogebec Development Company, which are $100 par, and the Superor and Wisconsin Land and Mineral Company, $10 par.

Boston Mining Stocks.

[From our Special Correspondent.]

BOSTON, March 17.

The market for copper stocks continues to rule dull and inactive. There is no disposition to trade in them, and transactions are confined to a few orders for investment ; consequently, prices are inclined to a lower level, and there does not seem to be much encouragement to hope for any improvement in the near future. Calumet & Hecla sold in a small way at $218, and later at $210@$212, ex dividend of $5 per share. Tamarack dropped to $93—a decline of $2 per share.

Quincy also is depressed, and, on forced sales of 200 shares, declined to $50, which is $3 lower than last week.

Franklin continues to decline, and touched $11½, with sales of about 500 shares from $12¼ to $11½.

Osceola gained $⅛ on sale of 75 shares at $20½. Pewabic sold at $2. Allouez at $1¾, and National at 75c.

The little boom in silver stocks started last week has subsided, and Bonanza, after declining to $1½, seems to have found its level, and is well supported at that price. Sales of only 4300 this week, in marked contrast to 57,000 last week.

Catalpa is a shade firmer, with sales at 35 to 40c. Boston & Montana declined to $3¾, and we note sales of Napa Quicksilver at 90c. Dunkin is in steady demand at 35@36c. "Cusi" is heavy, and was offered to-day at 25c. The call of the company on stockholders to contribute 15c. per share toward paying its debt is no doubt the cause of the decline. Bowman is dull ; offered at 12c., and no bids over 11c. for small lots.

Owing to the extreme depression in copper and silver mining stocks, the attention of the public has been called to the group of iron mines lying in the celebrated Gogebic District in Michigan. These stocks have been dealt in to quite a large extent in a private way, but no steps have been taken to bring them prominently before the public through the medium of the Stock Exchange until this week, when one of the group, called the Ironton iron mine, was listed at the board and received with a good degree of favor. The company is organized on a basis of 40,000 shares of the par value of $25 per share and non-assessable. The officers are all men of experience in iron mining, and have the confidence of the community. The mine is in good working order, and 17,000 tons of ore of high grade was shipped during the season of 1886, after July 15th, when the mine was opened ; and it is stated that there is 75,000 tons now in sight, ready to hoist, and that 60,000 tons have been sold for delivery in 1887. The net profit to the company will not be less than $1.50 per ton, and it is expected that the sales of ore this year will reach 75,000 tons, netting a profit of $2.50 per share. A large portion of the stock is held by parties who have taken it for permanent investment, after personal inspection of the property. The stock was placed upon the board this week at $10, and was in quick demand, and advanced on liberal sales to $12, with a slight reaction from the highest point. At these prices, with its prospects of dividends, it would seem to be very cheap ; and, no doubt, when the character of the enterprise is fully understood, will sell at a handsome advance over present rates.

Pittsburg Stock Quotations. Mar. 16.

Company.	H.	L.	Closing
Alleghany Gas Company.....	$35	$35	$35
Alleghany Heating Company.....	111	109	109
Bridgewater Gas Company.....	119	1 5½	119
Chartiers Block Coal Company....	40	40	40
Chartiers Valley Gas Company....	92¼	91½	91½
Consignee Mining Company.....	1	85	1
Forest Oil Company	106	100	100
Gogebic Iron Syndicate	5¼	4½	5¼
Hazelwood Oil Company.....	48	48	48
La Noira Mining Company.....	3¼	3	3¼
Mansfield Coal & Coke Company.	20	20	20
Natural Gas Company of West Va	100½	100½	100½
New York & Clevela'd Gas Coal Co	46½	46¼	46¼
Pennsylvania Gas Company.....	33	32	33
Philadelphia Company.....	55	54¼	54½
Pine Run Gas Company.....	99	99	99
Silverton Mining Company.....	2½	2½	2½
Tuna Oil Company.....	70	70	70
Westinghouse Air-Brake Co.....	9 1/16	97	97¼
Westinghouse Brake Co., Lt.....	50	50	50
Westinghouse Electric Company..	96	95½	96
Wheeling Natural Gas Company..	48	44⅝	44½
Yankee Girl Mining Company....	8	7½	8

Highest and lowest prices during the week.
* Ex-Dividend

St. Louis Mining Stocks. March 16.

[From our Special Correspondent.]

The feature of the market for the past week has been "West Granite." This property is near the Granite Mountain, and some of its stock has been placed in our market. The reports heretofore have been discouraging, and consequently trading in the stock has not been active. On Friday morning, it was whispered around that a strike had been made, and some few persons, claiming to have information, went into the market and purchased all stock offering from 90c. a share up to $1.50 per share. Next day the price was run up to $2.50 per share. Monday, it sold as high as $3.25 per share. Yesterday (Tuesday), it reacted to $1.50, and to-day rallied again to $2.50, at which price it closes. The reports are contradictory. The manager of the Granite Mountain reports the strike as being not true ; others telegraph to the same effect, while, on the other hand, the friends of the property claim that a big strike has been made ; we, however, place more reliance on the advices given by the Granite Mountain's manager, hence doubt the genuineness of the reported find. Ideal has been active and strong, selling up to 62½ cents per share. Hope sold at $7. All other stocks have been inactive, attention being confined principally to West Granite.

Company.	Location.	Bid.	Asked.
Adams, s. l.	Colo.	$2.00	$2.25
Courtland.....	Colo.	.....	.20
Granite Mountain, s.....	Mont.	62.50	64.00
Hope, s	Mont.	*6.75	*6.90
Ideal, s. l.....	Colo.	.55	.60
Iron Gold and Silver.....	N. Mex.	.....	.03
Laclede.....	N. Mex.	.03	.....
Lochiel.....	N. Mex.	.30	.35
Peacock...	N. Mex.	1.30	1.40
Quincy.....	Colo.	.....	.03
Sheridan..	N. Mex.	.40	.45
Small Hopes Cons., s. l....	Colo.	8.00	8.50
St. Louis & Mex. Imp....	Mex.	1.30	1.35
St. Louis & St. Elmo....	Colo.	.....	.35
St. Louis & Yavapai.....	Ariz.	.85	.90
West Granite, s	Mont.	1.75	2.00

* New stock. Par value, $10.

FOR SALE.

A large and valuable tract of COAL AND IRON LANDS in East Tennessee, containing about 16,000 acres ; also, WALDEN'S RIDGE RAILROAD FURNACE, COKE OVENS, etc., to be sold at chancery sale to highest bidder, at Court-House, in Knoxville, Tenn., on Monday, 18th day of April, 1887, at 11 o'clock A.M.

For terms and other information address

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